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ABSTRACT

This report contains speeches and notes of workshop participants meeting to work out school design guidelines. Participants included educators, architects, engineers, and contractors. Seventeen selections cover such subjects as cost and grant influences on education, schools as community resources, school planning--a team effort, rehabilitation and renovation, fire safety design, heating systems, school site utilization, and users' reactions to current school design. Related documents are EA 002 877, EA 003 048, and EA 003 049. (MLF)

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group reports
speeches
notes

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The Tenth Regional School Design Workshop
Prince Arthur Motor Hotel
Port Arthur - Fort William
October 6th and 7th, 1969

The attached speeches and notes are exact copies of material received from participants at the completion of the Workshop

SCHOOL PLANNING AND BUILDING
RESEARCH SECTION
ONTARIO DEPARTMENT OF EDUCATION

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OPENING ADDRESS by S.T. Orlowski

It is my privilege to welcome all participants to the 10th Workshop organized by the Department of Education. The subject of our deliberations is "Education and Architecture in the 20th Century". Our main concern during this Workshop is the elementary and secondary school.

It is not the first Workshop of this kind and it is not, I hope, the last one. We organize similar Workshops usually twice a year, in various places all over Ontario and the subject of our discussions vary too. But all pertain to the question of education and architecture. It is a vast subject. I might also add, that it is not an idle talk, because we gather people deeply interested in the problem of school building and working in this field.

We do not call our gathering "convention", not only because it earned itself a bad name and is associated usually with a good time and social activities, but mainly because it is "workshop" in the fullest meaning of that word. We are here to work out some definite guidelines for educators, administrators, architects, engineers, contractors, and the people responsible for education of our young generation.

In the period of time starting with the end of the war, our attitude towards educational needs changed several times; what followed was a change in the structure of the school building and modernization of educational facilities.

In the first years we needed more schools. Therefore, the accent was on the quantity of buildings. We needed more school buildings to accommodate the children born in the postwar years boom and the new awareness of the need for education. But the world did not stand still. Progress is not measured only in increased numbers but also and may be most of all by the dimension of depth. We have to grow in two dimensions - wide and deep. We have to have enough schools to accommodate all our children and we have to give them the best kind of education we possibly can.

The rapid technological progress demanded a drastic change in our attitude towards education and consequently - the role of architecture in it. Two questions appeared: "what" and "how".

"Brain Trust" consisting of educators, scientists, men of arts and letters, industrialists, down to earth businessmen etc., is working out a new philosophy of education. It tells us what to teach and how to teach.

It is not a rigid philosopy. It leave many open avenues for further explorations. This is what we call - flexibility. But we could call it also open-mindedness. In fact, I like this word better, because flexible are sometimes people who do not know their own mind, and open-minded people are these, who are always eager to learn.

An architect involved in school building projects plays a very important role. It is not only important but also very exciting. An architect must follow the new developments in educational philosophy but at the same time he must be ready for changes that may occur in the near future, he must allow for the changes in the foreseeable future. It is not easy and sounds almost impossible to follow the idea and at the same time to keep, so to speak, one step ahead of it. In the course of this Workshop, we shall try to show you how this seemingly impossible goal is attained.

There is still another factor involved in school planning. We must keep within the given budget. And here, similarly to design problems, we must resort to research. In fact, it takes sometimes a considerable amount of research to find a right answer.

Our Workshops are a part of the research program carried out by our section in the Department of Education. Workshops are really two-way avenues. The participants will listen to lectures, but there will also be time provided for discussion and criticism. Therefore, please do not hesitate to speak up. We want to hear your opinions.

And one more thought. Education is the most important business and school planning is part of that business. Quite recently we have heard from the Economic Council of Canada, that "government business, including education, operates under neither of the spurs which keep private business hopping: it is without competition and it is without the need to make a profit. If it does not want the voters to turn on it en masse, it should - at all levels - find adequate substitutes for these two spurs".

As a substitute for competition I would propose our conscience and the responsibility we have towards our young generation; as for profits - we may look forward to the dividends in the well adjusted and well prepared Canadians of tomorrow.

PRESENT AND FUTURE EDUCATIONAL NEEDS IN NORTHWESTERN ONTARIO
by R.R. Steele

Most of the problems which confront us in the area of school design are not new - they are problems of long standing, to which we have not yet found satisfactory solutions. I think that the majority of them fall into four basic categories.

1. Engineering
Most obvious, probably, are those problems which arise out of a lack of sufficient research to suggest design, engineering and construction techniques specifically suited to the climate and soil of Northern Ontario.

I need only remind you that we still have not found a certain safeguard against damaging condensation in some buildings.

We still see signs of serious settling or heaving under some conditions.

In too many cases, faulty roof design or construction results in costly and annoying leaks in a new building.

And to my knowledge, we still lack any scientific proof of claims to superior efficiency or economy of heating with electricity, natural gas, or oil.

Only a controlled experiment, with accurate costing of construction and maintenance costs over a significant period of years, could provide that proof.

I wonder whether, with two universities in Northern Ontario, we can much longer delay the establishment of an engineering laboratory to make a concerted attack on the problems of construction in this part of the province

2. Regulations and Controls
I am sure that every trustee, and every school administrator will agree that a second source of problems in school design and construction lies in the maze of regulations and controls through which designer and board have to find their way before construction can begin.

Every school building project in Ontario must pass the scrutiny and secure the approval of no fewer than four departments of the provincial government, and, in some cases, of municipal agencies as well.

Now no one would suggest that codes and regulations are unnecessary in guaranteeing the highest possible degree of educational efficiency and the physical safety of students and staff. But designers and educators have questioned whether the dollar cost of adherence to some regulations does, in fact, achieve the avowed purposes of those regulations. Those doubts are strengthened when these critics survey the wide variation of building codes from one province to another. Trustees and architects in this part of the province view with a questioning eye the unfavourable comparison of the cost of school construction in Northwestern Ontario and in the Prairie Provinces. Local school authorities in this province will inevitably seriously consider whether they should not press for and support the formulation of a national building code, with no provision for provincial or local amendment.

3. Designing for Change
Someone has said that the only permanent factor in our society is change. That statement is the third important source of problems in school design. How can we so plan a school that it will not be obsolescent - or, even, obsolete - five or ten years hence? The answer, quite obviously, is that we can't.

But I submit that there are some means by which we can minimize the impact and the cost of change in our schools -

1) The first is that elected officials insist that their administrators convince trustees that innovations in program are educationally desirable, and that resultant or concomitant innovations in school design are financially justifiable.

2) Secondly, a board of trustees has a right to be convinced that a new design concept is what a stock broker might call a "businessman's risk". By that, I mean that trustees should demand assurance that the innovation stands a good chance of remaining educationally viable over a reasonable period of time. And there are obvious means of securing the "businessman's risk" of which, unfortunately, too few boards avail themselves. I suppose that what I am really saying is that trustees are responsible for innovation, having been convinced of its wisdom by their professional educators.

3) When changing circumstance dictates an advance in design, it would seem only good tactics to provide, at the same time, for easy and orderly retreat. It is very poor practice to build without provision for possible future additions to the structure. It would be equally unwise to design a so-called open-concept school today without incorporating into that design those features which would facilitate, at minimum cost, reshuffling of instructional or administrative areas to meet the future see-sawing demands of change.

And you can be sure that many of today's popular innovations of concept and design, tomorrow will be passé, a fad that has passed, a bandwagon you jumped on.

4. Financial Problems

A persistant cause for concern in design and construction of school accommodation is that of cost and ability to pay. A few short weeks ago a valiant effort was made by the Premier, the Provincial Treasurer, and the Minister of Education for Ontario, to convince local school authorities that financing of future educational facilities was a matter of serious concern. The means by which our funded debt is to be controlled at a manageable level was, at least in part, left to the good judgement, the ingenuity, and the business acumen of the local school authorities. This is a considerable challenge. But I am confident that it is a challenge which our school authorities can meet.

Some belt-tightening is obviously called for, and just as obviously possible. Some means of doing this - and without too serious a loss of efficiency or quality - suggest themselves out of a survey of many projects recently completed in this Region, or presently building.

1) First, our boards must determine how much they are able to spend on a project, and then advise their administration and designers to "cut the pattern to suite the cloth".

2) Every attempt should be made to plan a building so that it could be used either for elementary or secondary school purposes.

3) Perhaps it is time that we take a serious look at our "standard of living". Are we justified in building some specialized areas? (cafeterias, shops, etc.)
Can we economize in provision for, and equipment of areas not used for instructional purposes.

4) It is entirely possible that we will have to consider need for accommodation from the point of view of the system, rather than the neighbourhood or the housing development.

5) What possibilities exist in your community for sharing of facilities by elementary and secondary schools, by two or more elementary schools, by public and separate schools?

6) Are we <u>really</u> providing the greatest possible amount of accommodation for the fewest possible number of dollars? Are our ratepayers getting full mileage out of their school construction dollar?

If it were necessary for me to justify the questions I have just raised, that justification will be found in a forecast of capital expenditures in this Region over the next five years. I am sure that you will find these figures interesting and enlightening.

FIVE-YEAR FORECAST — CAPITAL EXPENDITURES — REGION 1, NORTHWESTERN ONTARIO

	Elementary	Secondary	Portables	Retarded Children	Teacherage	Admin. Bldgs.	Other	Totals
1969-70	4,828,337	8,854,330	20,000	248,000	197,000	13,000		14,160,667
1970-71	8,318,000	2,250.000	35,000	90,000			827,500	11,520,500
1971-72	5,290,000	2,855,000				1,100,000		9,245,000
1972-73	4,550,000	4,000,000		50,000				8,600,000
1973-74	4,375,000	2,150,000				580,000		7,105,000
	27,361,337	20,109,330	55,000	388,000	197,000	1,693,000	827,500	50,631,167

PORTION OF TOTAL FORECAST BY LAKEHEAD BOARDS = 69.49%

SUMMARY OF GROUP DISCUSSIONS
SCHOOL DESIGN - COST AND GRANT INFLUENCES
Moderator G.S. O'Brien

A Cost Control

- is primarily the responsibility of the owner (i.e. trustee and educators)
- must be effected at the initial stages and then throughout any construction project
- only the owner can overrule any user committee that recommends components for a building (components may or may not be necessary or extravagant)
- the owner must exercise this responsibility
- the owner should employ cost analysis approaches for special areas to determine their influence on the entire project and hence make prudent choices.
- the Department of Education is most concerned with cost controls and ceilings and has established incentives and disincentives which should be seriously considered.

B Cost Planning

- more concerted efforts must be made to develop methods to obtain better utilization of our school buildings
- buildings have tremendous potential but how can we get the best value from them
- emphasis in planning must be on cost benefits and cost performance
- programming should therefore be utilized as an economy device in the planning stages (i.e. semesters, options, credit system, lighthouse concept, etc.)

C Community Utilization

- need for more effective social planning in design and construction of schools

- community use involves higher costs because of necessity for extra and/or special areas

- such costs should not be borne by education

- consideration must be given to cost sharing and pooling the resources of other community bodies

- schools might be designed with view to later conversion to other uses (e.g. multi-storey school easily converted to office building)

D Over-Specialization

- appears that secondary school trade courses are over-specializing with highly complicated machinery

- industry often requires up to 6 months to retrain graduates either because of wrong training or because of unavailability of sophisticated machinery used in the schools

- schooling should concentrate on basic principles with simple machines with more specialized training left to industry

- tremendous cost savings could thus be effected

E Co-ordinated Planning

- lack of co-ordinated planning on both local and provincial levels result in increased costs

- locally all educational bodies (i.e. Community Colleges, Universities, School Boards) and other community agencies should plan together to avoid duplication and overlapping in expensive facilities such as T.V. and data processing facilities.

- various government departments, school boards and civic bodies should be involved in a team effort in programming, that is in construction programming, financial programming and educational programming all of which are inter-related.

COST AND GRANT INFLUENCES ON DESIGN

by D.H. Matthews

The subject of our panel "Cost and Grant Influence on Design" has plenty of scope. I propose to concentrate on cost control in the first phase of the building sequence - the Planning and Building Proposal Stage. I wish to suggest to you that any successful cost control program, even to be partly successful, has to begin the same day the planning begins. Every decision has a price tag - and the big decisions are made at the Initial Planning Stage.

Assuming that it is agreed in principle that cost evaluation is a major factor in each decision - and the sooner it starts the better - how are we to isolate the costs of typical program decisions? I am sure I am following in the footsteps of many directors and administrators who have sought rule of thumb and "guestimates" to evaluate the end cost of program choices. Here, as an example, may be some program choices in a composite school building program:

1. Shall we have an auditorium or a combined function "cafetorium"?

2. Shall we have a pool in lieu of a third gymnasium?

3. Shall we instruct the architect to avoid pre-built space by planning the cafetorium and library for expansion, or shall we plan and build for the ultimate facilitiy right now?

4. Are we prepared to pay a premium for flexible space? How will we cut back in other programs or spaces to allow for the cost of such flexibility?

5. What is the cost of adopting proposed increases in teaching space recommendations? What will be the effect if the new classroom unit totals 1100 square feet. What will be the end cost per pupil place of such increased academic space in a composite school?

Now it is clear that answers to these questions have to be calculated on the basis of previous jobs, previous areas and cost approximations. There is no way to test these alternatives in the construction market place.

If I may refer you to the hand out sheets I will indicate an approach to program costing.

COMPARATIVE COST ANALYSIS
PLANNING STAGE OPTIONS

Net Functional Area Pupil Places		F&E P.P	T.C. P.P.	GOVT. COST	BOARD'S COST	BOARD'S NET COST NET F. PUPIL PLACE.
Academic 720 @ 30 p.p.	24 sq. ft. x $24.00 = $ 576.00	+ 100	= $ 676	50%	50%	$ 338.00
B&C 930 @ 30 p.p.	31 sq. ft. x $26.00 = $ 806.00	+ 500	= $1,306	50%	50%	$ 653.00
S.T.&T. 2,100 @ 20 p.p.	105 sq. ft. x $20.00 = $1,500.00	+ 1,500	= $3,000	50%	50%	$1,500.00
Theatre 2,000 @ 30 p.p. $18,000 F.&E.	66 sq. ft. x $24.00 = $1,584.00	+ 600	= $2,184	70 x 50% =35%	65%	$1,419.00
Lecture Room 1,344-108 p.p.	12 sq. ft. x $26.00 = $ 312.00	+ 38	= $ 350	50%	50%	$ 175.00
Classroom 1,100-30	36 sq. ft. x $24.00 = $ 864.00	+ 110	= $ 974	63%x50% =31%	69%	$ 672.00
Library	3 sq. ft. x $24.00 = $ 72.00	+ 12	= $ 84	50%	50%	$ 42.00
Auditorium *	18 sq. ft x $26.00 = $ 470.00	+ 26	= $ 496	0	100%	$ 496.00 *
Cafetorium * (Aud. Function)	4 sq. ft. x $20.00 = $ 80.00	+ 26	= $ 106	0	100%	$ 106.00 *

* TOTAL GROSS AREA - TOTAL SCHOOL PUPIL PLACES

It is probably possible to summarize these considerations such as the table suggests as follows:

1. Cost Control is a continuous function of decision making and it must not be left to the tender call stage and should not end at Tender Call.

2. The capital cost per pupil place varies remarkably depending how we house our pupils. Let us assume that the gross area for foyers, washrooms and circulation is about equal per pupil place. From the table, it is apparent that intensive use is required in shop areas and other expensive spaces to compensate for the high cost of these areas. The lecture room, as another example, is inexpensive to capitalize. Therefore, a large audio visual aid expenditure would be justified in this room if the lecture room could thus be made an effective teaching space.

3. Cost Control is a prime owner function and it is the board's responsibility to monitor and approve each demand for space, and equipment. The consultant does not have the power to limit or overrule a user committee - only the board has this power.

The second topic on our panel this morning is "Grant Influence on Design". In the private sector the parallel function is mortgage appraisal. In school plant approvals, I assume we are giving each project a debenture servicing appraisal. Let me give you a flippant defence of our operation!

We do better for you than the mortgage company. We calculate your "approved cost" four times. And also our "letter of committment" involves an an offer to service a substantial portion of the debenture. And recollect also that your "letter of committment" gives you access to your own pension fund at attractive interest rates.

A previous workshop speaker referred to the grant system "as a work of sheer genius--considering it was done by a bureaucracy". Well let me say where the genius may lay, and leave it up to you to remind us of the "bugs" still in the system.

The system - "the blackbook", has some remarkable capabilities - that is - when you compare it to gross area and square foot grant systems.

1. It allows <u>you</u> to determine the gross area on a new school without bonus or penalty.

2. It allows <u>you</u> to group expensive spaces all together, in an addition and dutifully adjusts your grant upwards in accord with the expense and complexity of the space - no crude average square foot cost figure here!

3. It allows you complete freedom in your assignment of space to storage corridors, mechanical space, administration and lounge area. You don't get any more grant but you do have freedom!

4. Within limits, <u>you</u> are even allowed to play around with your net functional floor area and be compensated for every foot you add or subtract.

5. It allows <u>you</u> to consider alterations as a legitimate solution to space problems. Not all grant systems, in the province, allow this. Indeed after 35 years of continuous use you don't even need to justify your alterations. We just give them a new name (renovations) and become very generous.

6. Another advantage of "the black book" you may have discovered. You can, if you burn the midnight oil, predict with uncanny accuracy the amount of money that the Department is "prepared to approve at the final stage" even before the site is known and well before even one tree has been drawn on the perspective.

<u>SCHOOLS - COMMUNITY RESOURCE</u>

by L. Minshall

Our school system and our communities are closely related. Planners place elementary schools in the centre of neighbourhoods; secondary schools become the focus of groups of neighbourhoods. Now community college have been added to the system and asked to relate to the needs of the area served.

The community is the product of the educational system. Not one person can escape it. All are affected by it. Therefore, whatever happens to one is relevant to the other. Their destinies are interwoven.

Today the community use of schools is a topic everyone talks about. There is no shortage of words but there is precious little action - at least this is the case when you speak in general terms throughout the province. Unfortunately, I do not know the north as well as I should. My experience is limited to Southern Ontario and my comments will draw on this experience.

Asked individually about the use of schools, I suspect you would say, "they are now open". When you say this, are you talking about the gym and, if the community is lucky, a swimming pool - or are you talking about the whole plant? Are you referring to use by a few youth groups, or constant use by adults and a wide selection of community organizations?

Are schools used for a significant period of time? Many are open less than 20 per cent of the time. I am certain industry or business would not tolerate this amount of use for their facilities. Yet businessmen and industrialists sit on school boards.

At the conference on leisure called by the Minister of Education in November, 1966, Mr. Davis said: "Cooperation between the school and recreation authorities in a community needs to be continuous so that the best and most dynamic program of recreation and continuing education is available to the citizens. All publicly-owned buildings must be used for program development. Facilities are of little consequence unless they are used to the maximum."

What are some of these potential community uses for schools?

The school should be the centre of all community services offered by the municipality to the general public. These will include:

- a public library service

- an art gallery and a gallery service

- a public museum and a museum service

- a centre for the creative arts

- a centre for fitness programs of a social, educational and physical nature

- a resource centre, containing program resources for individuals and community groups

- training centres for all types and all levels of leadership

- re-training centres for those with obsolete skills

- training centres for the illiterate and thow who wish to upgrade their knowledge and skill

- all public health services, including the M.O.H. and the Victorian Order of Nurses

- all personal and family consultant services such as the Family Service Bureau

- pre-school observation nurseries

- free nursery schools for working mothers

- free meals for those who feel the pinch of grinding poverty

- study areas for those who live in crowded homes

- a meeting place for the aged where they can enjoy creative activity and make a contribution to their community.

- a meeting place for the young where they feel at ease and can run their own show.

When the school provides these services, it will then be a community centre, accessible to and used by both young and old; a place where families can enjoy activities together.

As well as these public uses, there are private ventures that schools can sample:

- underground parking rights

- air rights above classrooms for housing developments

- ground level floor space for stores, offices and small businesses

These commercial ventures are now being considered in the Metro area where land costs are prohibitive.

What are the barriers to community use?

I know there are problems that must be solved before the needs of both the school and the community can be met in one building complex. I agree that educational needs must be served first. However, it is the phrase "educational needs" on which we get "hung up". Are the educational needs of adults of less importance than those of our youth? We do have two million illiterate in Canada. Must our re-training programs be housed in a separate building complex?

There is, it is true, little legislative encouragement for the community use of schools in Ontario. But there is nothing in the legislation that forbids it.

The Schools Administration Act (Section 35) provides that a board may permit the school buildings and premises to be used for any educational or other lawful purpose it deems proper, provided this use does not interfere with the proper conduct of the school. I understand the Department has no record of any board asking for an interpretation or ruling on this matter.

The same act allows a school board to permit a school playground to be used as a public park. There is no legislation that prevents a park being used as a school playground. As well, a school board may be designated by the municipal council to administer a municipal recreation program where there is no municipal recreation committee.

After recommendations regarding community use of schools were made to the Minister of Education in 1964, a committee was named by the Department to study community activities in school buildings. This committee was made up of representatives from the Society of Directors of Municipal Recreation, the Ontario Municipal Association, the Ontario Trustees Council, Community Planning Branch of the Department of Municipal Affairs, Community Programs of the Department of Education, the teaching profession and architects. The committee studies the problem from two different approaches:

- the use of existing facilities by community agencies

- the provision of community facilities as part of a school complex

Mr. Frank Nicol, Chairman of this committee and an employee of the Department of Education at the time, spoke at an O.R.A. zone conference in Brampton in April, 1966. He cited the following problems as barriers to community use, taken from the results of the survey:

- the grant structure
- liability, in case of an accident
- high rental fees caused by union agreements
- the difficulty of disciplining adult groups
- the ban on smoking
- interference with books, blackboards and cupboards
- equipment not returned to its proper place
- maintenance and operational control

Mr. Nicol, in speaking about these problems, stated, "most of these claims are not true, except in isolated cases." He referred to one answer received on one of the questionnaires: "The use of the auditorium is impossible at night because noise interferes with the night school program." Mr. Nicol went on to state, "while the layout was evidently suitable for educational purposes in the daytime, it was not suitable for extra-curriculum purposes!"

Incidently, this committee has disappeared. Why?

Other problems are often mentioned:

- the traditional approach by the school to avocational subjects in the night school program
- lack of storage space
- lack of access to washrooms from outdoors
- pride in spotless floors and walls, rather than constant use
- lack of a responsible attitude on the part of recreation groups and recreation personnel
- complacency of community agencies
- poor building design
- non-functional equipment and furnishings, e.g. fixed seats
- uncooperative custodians

I suspect the significant problems barring community use of schools can be listed as three:

1. Boards and administrators have so many duties and responsibilities now that they do not wish to add to them.
2. Maintenance and operational problems are difficult enough now without adding to them by opening schools to community use.
3. Fear of "outside" supervision provided by community groups and agencies wishing to use the facilities.

Are these valid reasons for limiting the use of school facilities?

The problem of "over-sized" budgets, just does not make sense. If the recreation authority is already spending money to secure facilities, then the money is being spent. We seem to think that costs split into two budgets are more palatable than they are when lumped into one.

What are some municipalities doing to face these problems?

Here is where I wish I knew your towns and cities better. I am sure there are jurisdictions where much has been accomplished.

I regret it, but I must go outside Ontario for an example of what I believe should happen. The city of Edmonton, as reported at a conference in Montreal in February, 1967, has a broad and general agreement between the Board of Education and the Recreation and Parks Department. This agreement covers the planning, development and use of indoor and outdoor facilities where a park adjoins a school. The school authority maintains and programs the building. The recreation authority is responsible for all outdoor scheduling, development and maintenance. Planning is accomplished together.

The city of Flint, Michigan, is the mecca of all who wish to see how schools can be the centre of the community. Here you can see the underprivileged eating breakfast in the school; a mother using the washing equipment in the home economics department because her own was broken. If you have not travelled to Flint and you would like to know more about their program, secure the film TO TOUCH A CHILD. It is available from the Youth & Recreation Branch, free of charge.

There are other examples that could be given. However, we have a long way to go before schools are used to capacity. As the Minister of Education has said, "Facilities are of little consequence unless they are used to the maximum."

What does the future hold for the schools and for our communities? Will we require schools at all as we know them today? If the core of the curriculum should be life and the skills of living, what will be taught?

Pierre Berton in his book THE SMUG MINORITY has this to say. "In the age of the computer, when the mass of people are freed from toil and want, education will assume an importance totally unrecognized today. For without education in an age of leisure there can be no freedom. One cannot begin to guess what forms education will take in the future; one can only predict with certainty that they will be varied and that the formalized school system, if it exists at all, will provide only one of many paths down which the learner will stroll."

We know that two per cent of the population will be able to produce all the goods and services required. What will people do?

Recreation and education will be so closely entwined they cannot be distinguished. The compartmentalized approach to various disciplines in study will be completely broken down. We have not begun to realize the implications of study for the sheer joy of learning - the very core of leisure-centred living.

If you have studied, even casually, the changes we face before the end of this century, you will be stimulated and challenged by what you have heard and read. If you are "tuned in" to the future, you will not be content to include adjustable walls and call the resulting structure a facility of the future. Will the buildings on our drawing boards be obsolete before they have served their time? I predict they will be, unless they have been planned to educate children and adults to live and to cope with leisure.

Will changes in our schools come quickly? I doubt it. We haven't yet secured one educational TV channel! Shaw's statement is relevant here, "if you don't get what you like - you'll end up liking what you get!"

People are beginning to realize machines can free them from most dull, repetitive and unrewarding jobs. Man now has a chance to preserve his dignity on the job and time to improve his mind off it. This we can understand. Have we fully accepted it? There is a great difference between understanding something and accepting it.

For years we have measured human worth by productivity. We must get off this production treadmill. Learning how to live with leisure will be the key to the future and learning how to live with an abundance of leisure is a challenge that must be faced by everyone - including the schools.

To me, the fate of our communities lies within our school system. What are we doing about it? I sincerely believe the very least we can do is open wide the doors of the building to those who own it.

SCHOOL PLANNING - A TEAM EFFORT
by G.L. Clendenning

My comments on school facilities will be based to a considerable extent on the comments of students and teachers at Hammarskjold. I have solicited the opinions of teachers and submitted questionnaires to students. Although Hammarskjold is a relatively new school, both staff and students have suggested changes in accommodation to provide for changing methods and programs.

The trend towards more independent study, more research and more unassigned time for students has been given impetus by the Hall Dennis Report.

At Hammarskjold we have a large library, a lecture hall (seating 150), listening and viewing area, seminar rooms and some study cubicles. At any one time we may have 50-100 students on independent study programs. Some Ontario Schools may have 10 P.C. of their student body so engaged. The Thornlea Committee recommended that 25 P.C. of a student's time be unassigned. A school of 1,500 may require accommodation for 350-400 students who would not be in regular classrooms. They would require places in seminar rooms, in listening areas, inthe library or in study carrels. Our students require more study carrels.

Rooms without windows often receive unfavourable comment from students and staff but from the results of a recent survey it would appear that students are not bothered by claustrophobia if the rooms are air conditioned and there are paintings or pictures of outdoor scenes on the walls.

We have had problems at Hammarskjold with vertical metal venetian blinds. They rattle in the wind when the windows are open and they break easily.

Double occupancy lockers create security problems.

Exposed ceiling beams in the gym collect volleyballs, badminton birds and other physical education equipment.

In the future, there will be an increasing need for areas that can be quickly subdivided into small rooms for tutorials or seminars or rearranged for large group discussion. When Hammarskjold was built, temporary walls were installed between the seminar rooms but as the temporary walls are of cinder block, it is impossible to change room sizes between periods. Folding walls as provided in the Avila Centre seem to provide sufficient sound barrier and the rooms can be subdivided in a few seconds.

I realize that schools are being designed on the open concept with possibly a whole floor being provided for the study of one subject. In my opinion provision should be made for subdivision of the area. Some students and some teachers cannot do effective work when nearby groups are visible and can be heard. I have sat on the edge of one group in our carpeted library and have had difficulty following the discussion because of sound interference from other nearby groups.

Hammarskjold staff makes good use of a staff work room where they have equipment to prepare lesson aids and appreciate small Department offices. Other Lakehead staffs are envious of our workroom and small offices.

As schools are being used in the evening both by students and adults, consideration should be given to setting up as a unit the facilities used in the evening. The gymnasium, lecture hall, cafeteria, library and public washrooms should be in an area separate from the rest of the school. This organization of facilities would be more convenient for the public and would tend to prevent loss of equipment from and damage to the school and allow for easier supervision.

As Parks and Recreation at the present time does use school facilities and will be making increasing use of the schools in the future, I have asked Mr. Morgan to give us some of his ideas on school planning. Mr. Morgan is a Port Arthur and Thunder Bay alderman who is Chairman of Parks and Recreation Committee for the City of Port Arthur.

SCHOOL PLANNING - A TEAM EFFORT
by M.E. McCabe

I have been asked to present to you the position, as I see it, of the trustee in relation to "School Planning - A Team Effort."

As in other phases of a school systems operation, the controls exercised by the board over a building program will vary from board to board. The size of the school system will make a difference. The concept which the board has of its own role is a factor. A great deal depends upon the superintendent's ability to develop a well reasoned proposal which is based upon a thorough professional study but which when presented to the board is not a fait accompli. Adequate controls must be developed so that the board may be comfortable with the delegation of the execution of its policy. I would further point out that such a relationship require points at which the board must make decisions before further planning can be carried out.

Circumstances will alter cases and here the big changes come about because of the larger units of administration. In many past situations there were small boards with very few full time and in many cases only part time board office personnel. The consequence was frequent meeting with the architect and a deep personal involvement on the part of most trustees in any given project. With the evolution of the larger units of administration, larger and more highly qualified board office staffs the trustee can to some degree withdraw from the deeper involvement and hold to his proper position - that of policy maker.

By way of illustration I might say that I have seen various sizes of boards and delved into their attitudes as it affects construction. On the one hand in Western Canada, I saw a board that had a few policy statements with regard to construction. The one provided for a functionally designed school abreast of the latest pedigogical methods and all that meant at this time was open concept schools and the other policy statement called for costs not to exceed $16.00 per square foot, which has more recently been updated by an additional 10% allowance. In this particular board which follows very closely the Davis Dickell System, the board staff would present the problem of pupil places and then offer the solution, be it an addition or a new building, its location, size type of academic program to be carried on etc. Upon acceptance of this, they proposed to the trustees, the name of the architect to be commissioned to undertake the project. The trustees were then out of the picture until the plans and specifications were presented for final approval and here, possibly for the first time they would meet their architect. The final occasion would be the opening of tenders and presuming there was a bid meeting the policy statement of $17.60 per square foot the awarding of the tender.

In the case of another board in another part of Canada, this being a small board it was just the opposite. Here the board was very deeply involved and listening to the situation, I was left with the distinct impression that although the board commissioned one architect, they in fact, had nine including the eight trustees. The involvement of these trustees was such that I was left with the feeling that greater economies and a more functional building might have been the result without them, if the administration and the architect had been able to play a greater role in the project.

Here there are no very distinct extremes. Applying this to our area and keeping in mind the size of the board, I would hope that what would be desirable would fall somewhere between these illustrations.

I suggest the trustees' position in the planning team might be along the following lines.

The administration presents a report to the board outlining a problem with regard to pupil places and proposes a solution. The trustees, having examined and discussed the report, might then authorize the project subject to the department approvals etc. From this point, the administration would look after providing the department with all the information required to bring about the government approvals. Upon receipt of this, and advising the trustees of the same, the trustees would appoint the architect. I would then, as a member of the board, desire a building or somesuch other committee meet with the architect and clearly convey to him our thoughts as to possibly the general design concept, cost per square foot, special features and possibly the total square footage not to be exceeded. I suggest that the board should have certain basic concepts prior to meeting with the architect. In this I include that matter of open concept versus the traditional egg crate school and also the matter of utilization of the building and grounds after hours by the community.

Here are a few examples:
The next time I would desire to see the architect would be with a number of schematics showing the general floor layout and I would hope after a good discussion one of these might be approved. From this point on, the architect would be able to work with the administration and teachers. I cannot overly emphasize the necessity to work with the

teachers. Who would consider having a new home designed and not consult his wife and even more particularly with regard to the kitchen layout. So to, with the teacher working in the school. By way of illustration, our own property and planning committee recently met with the teachers of one of our senior elementary schools. Another such building is coming up and we wanted the opinion of the people using the building. In effect they saved us possibly as much as $75,000.00 and then showed how to more effectively spend this money by having a much larger library and material resources centre consistant with the direction in which we are heading in today's school program.

I would next expect to see the architect for final approval of plans and specifications and following this, the tender call and awarding the contract.

In between this, at various regular board meetings, the administration will be presenting requests for approval of equipment lists etc. If the board is firm with the architect in the matter of final costs, frequent meetings should not be necessary. Our boards in this province have recently been charged by our Premier and the Minister of Finance and Education, to reduce spending. This also applies to new construction. They appear to be determined to have boards stay within the approved dollar allotment for a given project. It is rather obvious that the specification writers must reduce the content of our buildings, and some of the aesthetics and start living within reduced construction budgets. Our cost per square foot in Northwestern Ontario must be brought in line with what is acceptable in other parts of this province and nation.

I would hope that I have shown that there is a place for the trustees in the planning team but that it must be consistent with his position as a general list as opposed to that of a specialist.

SCHOOL PLANNING - A TEAM EFFORT

by F. Sabatini

I have been asked to present the viewpoint of the Administration on the team effort required in School Planning.

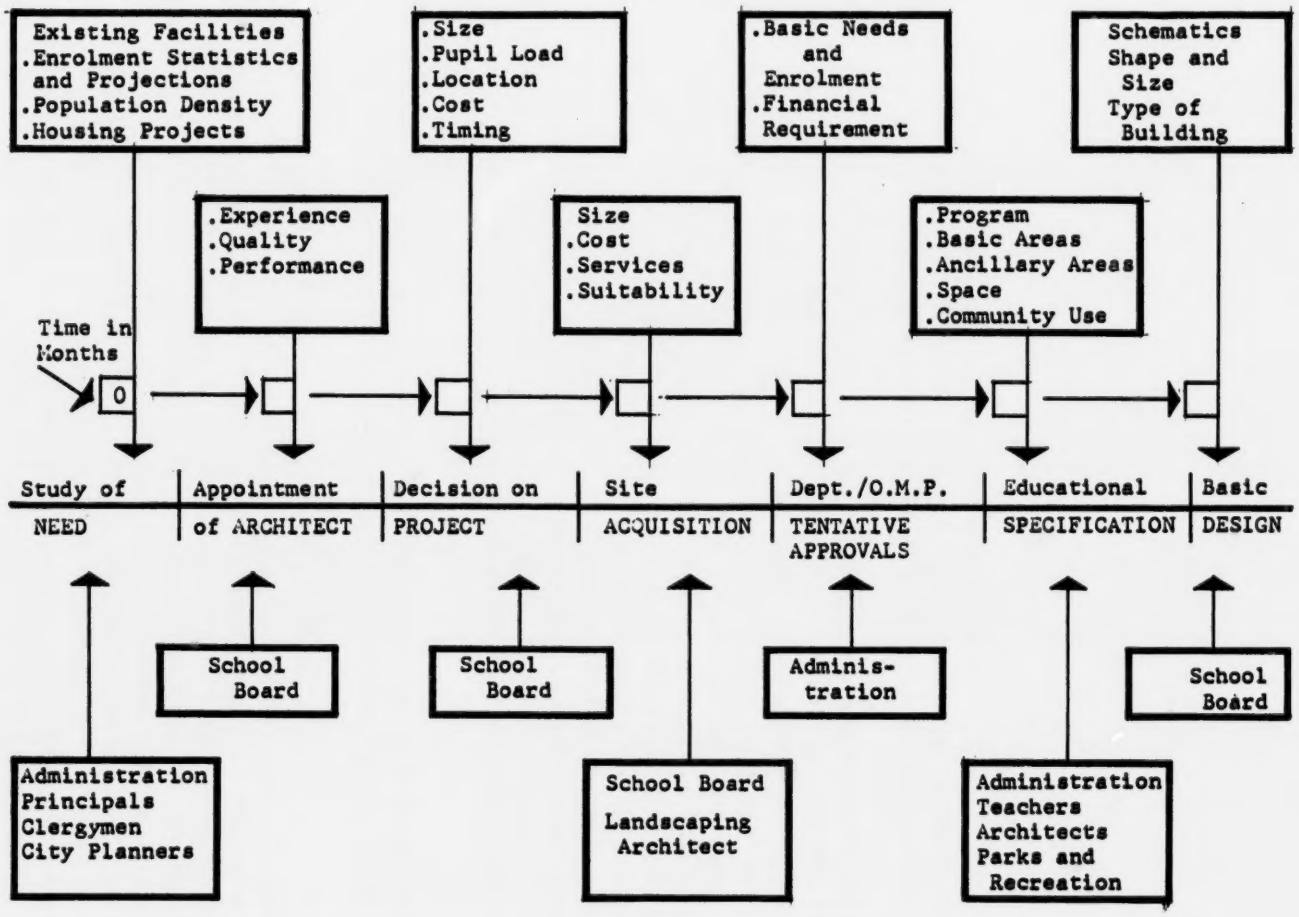
The decisions made in the design and construction of the new buildings affect students, educators and the community at large for many years to come. Therefore, imaginative planning of buildings and facilities is a necessity if these are to serve educational purposes fully and efficiently. Senior Administrators have a great responsibility in this respect. They must be knowledgeable about research and development in education and see that the school board trustees are kept informed of new programs, techniques, methods, equipment and organizational concepts.

It was not too long ago that schools based on the old cellular system of the predetermined number of pupils and one teacher in one classroom at one time, was being constructed. Since that time however, fantastic strides have been made in Ontario with respect to the changing concepts in education, and fantastic strides have been made in the provision of facilities to cope with these ever changing needs for educational purpose. School boards in Ontario are now building schools which provide the flexibility to cope with their individual philosophy of education. To provide this kind of school building which education needs requires team planning - a team to plan the school and get the many ideas formed into policy to produce the desired result.

The role of the Senior Administrator is one of complete involvement from beginning to end. Initially required is the development of a plan of future school accommodation for the entire school county or district, be it a five year plan or even a ten year plan. In order to accomplish this, the administration must first establish a relationship with the local planning authority so that the information on residential and industrial development is readily made available. Careful study must be made of zoning regulations and possible changes so that the potential residential density of any particular area may be fairly accurately predicted. Based on this information, and in mind of the board's individual philosophy of education, a proper plan of future school accommodation needs including the financial implications can be developed. Changing conditions may require that the plan be altered or modified on occasion but it should serve as the guide to the future construction plans of the board.

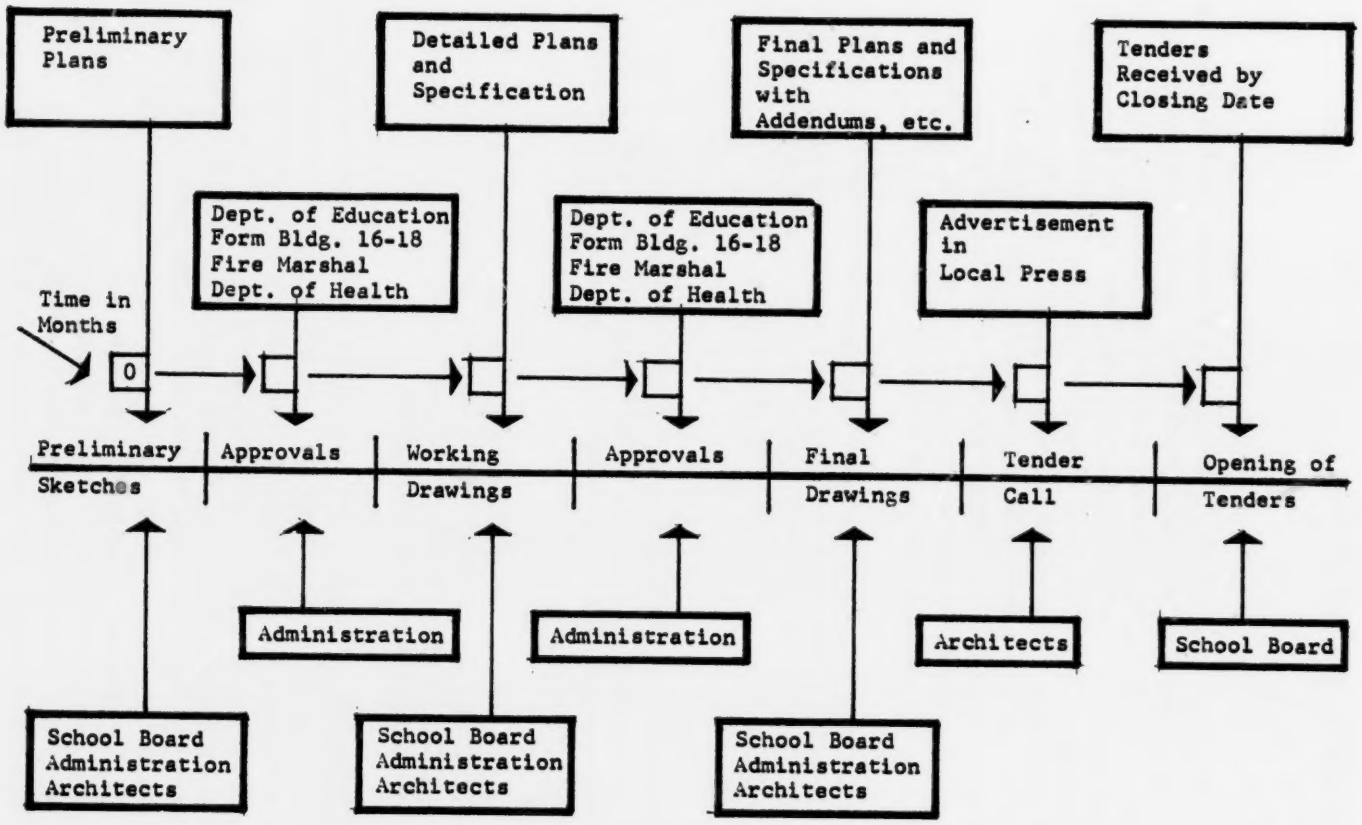
When the construction of a new school is contemplated by the board, the administration is responsible for the processing of a number of matters which relate to the approval of the proposed project by the appropriate bodies. We are presently designing for our board's particular operation a School Construction Procedure Chart. This chart indicates the individuals involved in the team planning, the procedures to be followed, and the timing and progress being made on the project. By means of the overhead projector, I will not outline this chart in a little more detail.

FACTORS OF INFLUENCE



TEAM PERSONNEL INVOLVED

FACTORS OF INFLUENCE



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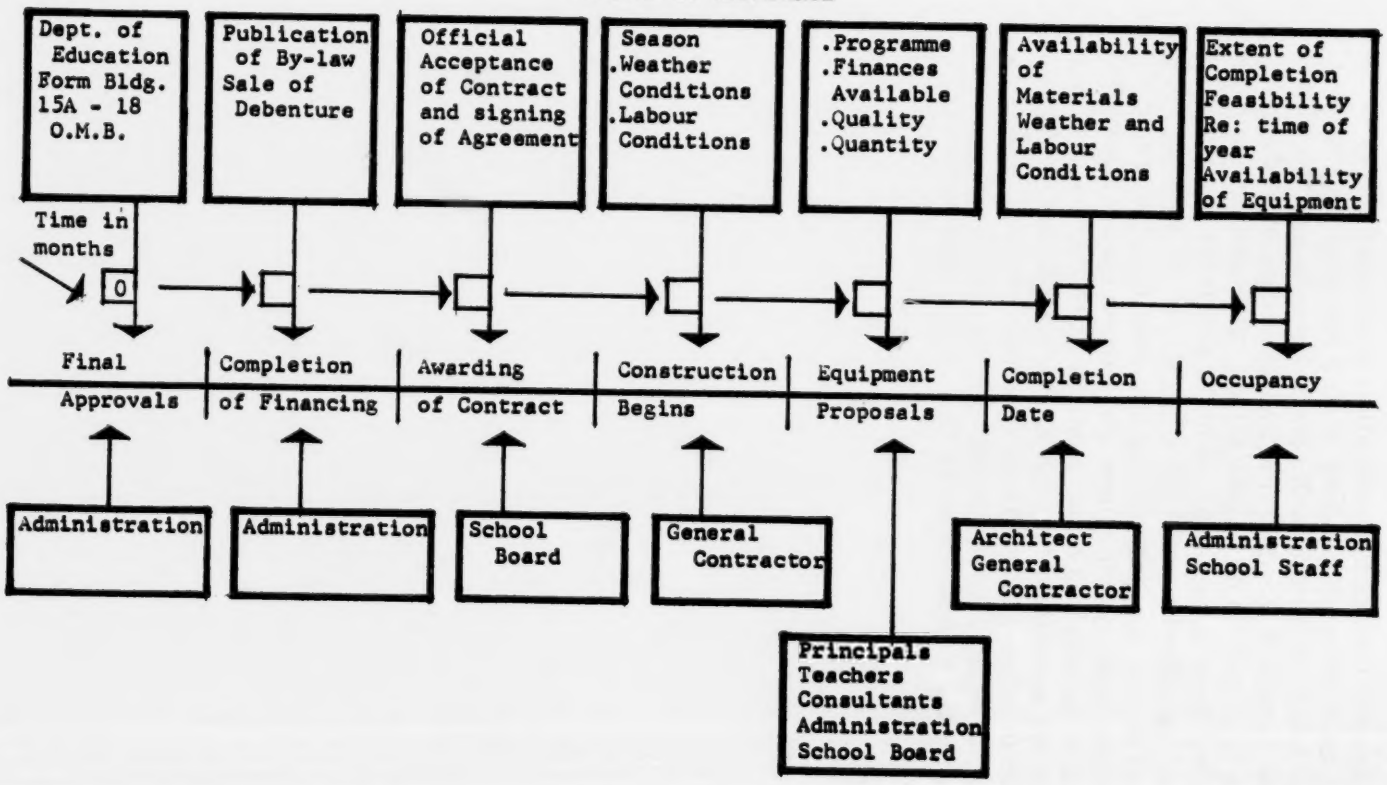

TEAM PERSONNEL INVOLVED

I believe that everyone involved in education has a very heavy responsibility to take every opportunity to find out about the various studies that have been conducted both here in Canada and the United States on the new approach to education and the kinds of buildings produced to cope with the needs of education. This can be accomplished not only through reading the material which is available on these various subjects, but also through visits to the school systems. We are all aware that we can see interesting and exciting illustrations of new school types in many magazines and we can hear and read all the best PR about buildings and about systems of education, but in my opinion, there is no substitute for a personal visit to see how these buildings operate in terms of their alignment with the particular philosophy which is being followed in the school. With this type of knowledge we can play a more effective role in the team approach to school planning.

SCHOOL PLANNING - A TEAM EFFORT
by P.J. Ranta

After hearing from our Trustee, Earl, I find that I cannot let his remarks go by without a comment or two even at the risk of appearing to be on the defensive. I must say that the subject matter brought up by Earl is not unusual and that it even reminds me somewhat of the Architects' Annual Conventions. It has become almost routine at Workshops and other similar meetings to consider architects and other professionals as prime targets and the cause of any problems which may exist. However, since school boards themselves were the target of the Government in Toronto just a few weeks ago, it isn't too surprising that architects should be the goat here today.

I do not think that architects or any other professionals need apologize to anyone for their right to make a living and I want to assure all present that architects are and want to continue to be a vital part of the team which is charged with the responsibility of providing adequate educational facilities.

I intend to keep my remarks brief, since I am sure that all of us are here to learn by listening to and participating in the dialogue. I hope there will be an opportunity for such participation during the discussion period to follow this panel.

The subject to this panel "School Planning - A Team Effort" is so obvious that it is rather difficult. I do not think that we are here to go into the details of actually planning a particular school building but to cover the subject in the broadest possible terms.

The timing of the school planning Workshop is an anachronism in view of present Departmental fiscal policies. However, since we are here and since there is nothing to look forward to but improvement, it is my intention to approach the subject positively and in the broadest possible sense. School planning is done, of course, at many levels in this sense, for example, that the Government through the Department of Education sets the policies and the criteria which school boards, teachers, administrators, caretakers, architects, parents and students must or at least attempt to follow. Yes, I think we can safely include the students since they, after all, are at the centre of the whole picture.
Team effort is obviously the total involvement of all concerned in the total design process. The climate for this process is created by Government which determines not only educational standards and requirements but also the fiscal policies. The interpretation and adaption of these standards and policies to local requirements is left to the remainder

of the team. The architects, engineers and consultants who are part of this team become the co-ordinators and producers of the results of the total team effort.

The main aspects or considerations of planning are:

1. Fiscal policy which determines how funds will be raised and spent. (this is a highly political consideration). Property taxation for educational needs can well be questioned and perhaps more equitable means should and will be found. Many levels of Government are, of course, studying this very matter presently.

2. Educational objectives to equip our young people for their responsibilities in the 20th and 21st centuries. Programs to suite particular areas and needs should be thoroughly researched.

3. Aesthetics in every sense involving everything from the smallest item to the whole building, landscaping, the urban, suburban and rural surroundings, in fact the total environment.
The fiscal and aesthetic aspects are the "hows" while the educational aspect is the "what".

With all of our affluence, professional, technical and technological know-how which has taken man to the moon and back in the 1960's, it is difficult to understand why more importance is not placed on aesthetics in our physical environment at least as one vital factor in the total scene. It would be tragic if the end result of all this progress is to drown ourselves with the monotony and ugliness of purely mechanical solutions. Surely the very nature of man is not only capable of appreciating these neglected sensitivities but will ultimately cry out in the wilderness and demand gratification in this regard.

As mentioned at one of the group meetings this morning, teaching itself is becoming a "team effort" with the co-operative teaching approach now being used in our new open-concept schools. Even this Workshop is a team effort. Problems in physical school planning usually result from one or more of the following factors, many of which could be reduced or eliminated by a team-work approach:

In listing these factors, I shall be firing a few pot-shots of my own.

1. The requirements of the programs are not clear and often fluctuate terribly even during the very final stages of planning.

2. Budgets for tentative Departmental approvals are often struck without due regard to ultimate program or realistic appraisal of costs. When the actual planning is commenced, then it suddenly becomes apparent that the budget has very little, if any, relationship to the program and its requirements.

3. Lack of a comprehensive grant structure which would truly acknowledge and reflect regional differences in construction costs for all reasons. While there are three cost zones so to speak in the whole province, it is certain that we should have at least three separate cost zones in Northwestern Ontario.

4. Some Departmental Regulations result in provision of space which cannot be educationally justified and which in many cases is not required by the board involved. This unnecessary cost is incurred in the name of qualifying for the maximum possible grant. This would appear to make school planning a victim of the system.

5. Research by Government and other bodies such as S.E.F. which is Metro Toronto's Study of Educational Facilities is vital to the planning process. This study of component systems of building and tendering consists of several pilot projects of which at least two are presently under construction. More research is required, particularly in the area of building construction itself.

How does each party fit into the system?

1. The Government, through the Department of Education, should set the climate by implementing their policies through properly researched Legislation.

2. Boards, administrators and educators determine the program suitable to their area as per Department of Education policies.

3. All users including teachers, students and caretakers should be consulted for complete liaison but decisions must be subject to ratification by the Trustees of the board who are the elected representatives of the people.

4. Architects and engineers should work in very close liaison with the above groups as well as other governing departments such as Labour, Health and the Ontario Fire Marshal. All engineers and consultants should be continuously involved with the project from the earliest preliminaries on to tender calls.

5. And last, but not least, there is, of course, the general contractor

and his team of sub-trades, suppliers and fabricators who complete the team effort. His part of the team effort is to produce a good building on schedule at an acceptable cost. However, I shall leave further comment on this subject to the next panelist.

Before concluding, I would like to add that I agree with the trend towards more community use of our educational facilities which have such a low percentage of utilization now. One example of this trend in Port Arthur is the recent library addition to a high school which can conveniently serve both the students and the public. I thank you for your attention and shall be pleased to answer any questions which may arise during the discussion period.

CHOICE by D.W. Morgan

I think we tend to exaggerate the "generation gap". To my way of thinking, there are basically three approaches to living, or three basic life styles that are available to the youth of today; and at least two of these are available to those of us who are the "over-thirties".

What are these three choices? 1) We can say that the challenges of the world are too great for us and "cop out". 2) We can be, like the majority of today's youth and adults, and go along with the "system" as it is, or 3) We can become "activists" and try to actively reform or improve the system.

Let's look at these three choices in a little more depth. The hippies have chosen to reject completely our present way of life. We must recognize that theirs is a powerful form of protest. They deliberately eschew some of our most sacred gods, such as ambition which is the powerful urge to grow and create, and success which we tend to equate with wealth.

The true hippie is basically a selfish person as he lives virtually only for himself. The over-thirty equivalent tends to become at best a dreamer, at worst an alcholic.

What is we choose to be like the majority of today's youth and the majority of today's adults? For a student this would mean accepting his school, college or university pretty much as it is, in order to get the degree or diploma that is currently required as the passport to the "good life". For us it means being good, hard-working citizens; probably being active in a service club, canvassing for the United Appeal, encouraging others to adopt a child and so on. But still and all, we would have to admit that the great majority of us are largely indifferent to everything except that which satisfies our own needs. We, like our student counterparts, are pretty well satisfied with the "status quo".

The third alternative would be to become an activist or a reformer. For the students this would mean trying to really change and improve their school, college or university's essentially autocratic approach to the learning process. For us, it would mean really doing something concrete about the "ills of society".

Let's go back to the hippies for a minute. Even though they are a very small minority of today's youth, they appear to be a real threat to us; their life style is a direct insult to most of the things we believe in. They seem to prefer a life of poverty. Their use of four letter words, their aversion to water, their apparently wonderful sex life, singly, doubly and even communally, gets us all "uptight". Perhaps their most annoying trait is that they add virtually nothing to the Gross National Product, enjoying life, while we work like hell to support ourselves and them, and get ulcers into the bargain.

Inspite of all this, I think that they have been, and are, a powerful force for the good. They protest man's inhumanity to man as exemplified by military spending of approximately two hundred billion dollars annually, while hundreds of millions of people are either on the verge of starvation or live a life of complete misery and hopelessness. They have decided that the system we live under is basically anti-human and that it can't be, or won't be, changed sufficiently to allow them to live within it, without hypocrisy.

And yet though they may be "drones" living off the rest of us, haven't we something to learn from them? Doesn't our world desperately need more co-operation, less competition -- more tenderness, less callousness? For there won't be any houses in the suburbs of our nice white western society if we don't learn to use our "naked ape" aggressiveness more intelligently. Perhaps the hippies' greatest virtue, is that <u>they have</u> had the courage <u>to apply their convictions to their life-style</u>. That takes alot of guts -- more than most of us have.

As William Sloan Coffin* has said, we have <u>opinions</u> galore, but a paucity of convictions -- and we don't embody our <u>convictions</u> in our lives.

The hippies have forced alot of us to re-examine our values and our life styles. We have been forced to think through what we stand for, and what kind of life we wish to lead. That kind of thinking can produce some very uncomfortable moments during the quiet summer months, or when you are travelling on a plane and don't feel like "burying" yourself in a book.

The most telling criticism that can be made of the majority of students and adults is <u>our refusal to be aware of the implications of what we do, or don't do.</u>

* Chaplain of Yale University

Herbert Marcuse, the 71 year old philosopher of the new left, condems us when he says that we devote far too much of our scarce resources to nuclear weapons, to waste, and to creating false needs by advertising. The resulting inequality leaves the poor eking out a dismal existence at home, and a desperate existence in other parts of the world. He contends that the politicians, industrialists and bureaucrats, (including educationalists) with their total control over the economy, leave man <u>apparently</u> free, but in reality conditioned to a kind of slavery; satisfied, yet unaware of true satisfaction; in theory concerned with justice, but in fact defending the interests of the administrators who manipulate us.

I think it is fair to say that most adults in the western world recognize that there are many things about our society that are wrong. We feel, however, that a significant portion of the predicted growth for our economies over the next decades will be used to reduce the inequalities and injustices at home and abroad. If we really care about improving the world, then it is our duty to adapt and change the system, so that its incredible efficiency can be used to alleviate the hard-up millions in city ghettoes and rural backwaters, and bring under-developed nations into the mainstream of the world.

Unless the revolutionaries.....or extremists produce some convincing evidence that the destruction of the present system would in fact work to the <u>benefit</u> of the underprivileged, they run the risk of appearing naive. We, on the other hand, can be considered sick or perhaps even evil, if, having recognized the need for reform, we do nothing to help bring it about.

This leads me to my final point, which is that all of us should become "activists". Dr. Samuel Gold's* recent challenge can be applied equally to individuals: he says "every college and university must begin, if it has not already begun, to think through formally and systematically to some sort of conclusion as to <u>the kind of society</u> it is actually eager or willing to see emerge over the years; it must also determine what place it has in the building of such a society." You and I must think this through also, with reference to our own lives.

William Sloan Coffin has said that most American businessmen are such practicing cowards when it comes to controversial issues, that they make common integrity look like courage. He says that as people climb up the success ladder, they become blander and blander. When businessmen ask why so many students are out in the streets protesting, Coffin replies that it's because most of those in positions of authority have been derelict in their duty of standing up and being "counted when it counts". No wonder, he says, students have become cynical about the business community.

* Chancellor of the State University of New York

As disquieting proof of this cynicism, only 4% of the 1969 Harvard graduating class entered the business world.

So what can we do? What is our duty? First, I think, we have an obligation to look very clearly and very coldly at the real ills of our society. Margaret Mead's* list is a pretty good starter. She says that our capacity to feed the world will not last, and that birth control is both possible and necessary; that if the pollution of air, land and water is allowed to go on, this planet will soon be uninhabitable; and that as members of one species living on one planet, all invidious distinctions based on race or colour must vanish.

We must also recognize that even if we solve most of the economic injustices at home and abroad, the world of tomorrow could become an antihuman bureaucratic nightmare of the "1984" variety.

Our next step should be to draw up a "plan of action" on a priority basis. Unlike St. Paul's complete and sudden conversion, we can realistically only try to change a little for the better -- so priorities are essential.

The following is my first try at such a list:

Priority A: People come first, not dollars. I am going to try to confirm this commitment by every decision that I make. For me this means supporting and applauding the Manitoba Government's recent decision not to floor the Indian Lake area. Even though such a plan would have produced more hydro at less cost, it was turned down because it would have completely disrupted the lives of 700 native people, and would probably have upset the ecology of the area for generations. Such a philosophy means, for instance, that I will try to do everything to get Ottawa to spend less on defence and more on subsidized housing; it means supporting wholeheartedly such policies as the guaranteed minimum income, now, even if it means paying higher taxes.

The Economic Council expects our economy to grow by 35% by 1975, and an additional 25% by 1980. It should therefore, be perfectly possible by 1980 to eliminate the inhuman and incredibly wasteful cycle of poverty that is currently the lot of one in every four Canadians.

As my Priority B, I plan to push for our government's greatly increased role in helping underdeveloped nations. This would mean backing up a massive scientific and humanistic effort for low cost and effective population control, combined with more trade and aid. The U.S. and Canadian gross national product per capita is approximately 2000% higher than that of the forty poorest countries in the world, and that gap is widening every year. The (economic) chaos that is forseeable due to this disparity is in my opinion more threatening than a nuclear war.

It is easy to make lists -- it is going to be much harder to put such priorities into practice. As Sloan Coffin has said, "the world is so much more able to shape us for the worse than we are able to shape it for the better."

The activists among the younger generation have accused us of many things, and many of their accusations hurt. It is my hope that we can (a) accept the incisiveness of their criticism and (b) choose to commit ourselves to doing something concrete about improving the state of the world, for which each of us is in part responsible.

*World Renowned Anthropologist and Author

REHABILITATION AND RENOVATION OF SCHOOLS
by W.J. Griffis

Knowing precious little about the subject of Rehabilitation and Renovation of Schools, I decided on using a three way approach. Firstly, I would research the subject in books available, I found mighty slim pickings there, secondly, I would consult experts in the field, I did hit pay dirt there, but they were cautious not to tell me all they knew since they wanted to save some of the ammunition for the discussion period later - thirdly, I would put on a bold front and sort of stretch things out with a bit of bull. Which reminds me of the story of the old mother cow who was contentedly chewing her cud on a high plateau while her little bull calf ran closer and closer to a 3000 foot cliff. It would run up and look over and run back, run up and look over and run back; one time it went a little too close and down it went 3,000 feet to the rocks below, and the old mother cow, still contentedly chewing her cud, rose leisurely to her feet, looked down and said, my a little bull goes a long way.

Then I got the brilliant idea that perhaps if I illustrated my subject with some pictures, that would eliminate some of the talking on my part, since I heard somewhere that a picture is worth a thousand words or something like that. So I went out and had some pictures taken - well, they didn't seem to help me much - so by now I was thoroughly confused - perhaps you will be as confused as I am before I'm through - so much so that you will be provoked into giving us some good ideas - some right answers - you see, I suspect that what I say doesn't really matter other than to be the catalyst designed to generate a strong social and mental reaction from you.

What do we mean by Rehabilitation? - What do we mean by Renovation? Why the twin topic? They seem rather synonymous words when put together - yet separately they are not quite the same - the dictionary defines them as follows - rehabilitate - "to put back in good condition", renovate - "to make new or like new, clean up, repair, restore"etc. I suspect that when we are thinking and talking of rehabilitating or renovating a fifty-year old school, we mean to do just more than to put it back in good condition or to make it like new - the good condition it was in fifty years ago? Like new when it was built? or new by today's standards? Sure we can replace the plaster walls, the ceilings, the floor, the blackboards, but with the same high ceiling, the ornate wood trim, the wooden floor, the heavy radiation, the clumsy windows, separate cloak rooms, open stairs? I think not. The lapse of time has introduced a new element to change the meaning of rehabilitate and renovate - today's standards of materials - and their application - materials with greater durability - easier to clean and maintain - greater selection of materials - i.e. carpeting or tile on floors as well as wood, terazzo or ceramic tile.

Today's improved mechanical and electrical fixtures are more compact and efficient with longer life and greater output, greater control. Today's need for greater illumination, less depending on natural light. Today's concern for acoustics in the classroom - all these add up to a new and different environment in a classroom or in a school. Today's needs for a more flexible classroom with emphasis on the needs of the pupil as it relates to the curriculum.

Larger areas, special areas, new and additional equipment, the use of audio-visual aids, libraries, greater need for storage, easy access to materials, greater concern for standards of health and cleanliness, stricter standards for safety - all these add up to the fact that like the fifty-year old school, the definition of the words rehabilitate and renovate are outdated too by today's standards of construction, by today's educational requirements, by today's school-house environment.

What we really mean and what the topic should be is "Updating Schools". The danger in accepting up-dating a school in its fullest meaning, would be to go far beyond the intent or meaning of rehabilitate or renovate for such a project would most certainly involve alteration of existing facilities to a great extent if today's environmental and curriculum requirements were to be met.

An examination of grant regulations certainly points up the fact that the two programs are not the same. I do not intend to discuss grant regulations, there are others here more capable of leading such a discussion, than I.

I just want to point out that if a full updating project is undertaken, it will no doubt involve some considerable alterations. At this point we might define alteration as to alter use, change space, or add additional space to an existing building.

Our terms of reference this morning seem to be to limit our discussion to the topic - Rehabilitation and Renovation of Schools - but within the definition of the larger meaning of updating.

You might ask can we undertake a program of rehabilitation without renovation or alterations being involved. This is possible if we consider rehabilitate as a program of putting the facilities of a school and its

classroom back in shape - such a project would involve a minimum of changes - improved surfaces - interior walls, floors, ceilings - exterior walls - windows, changing furniture and furnishings, replacing equipment, with the whole designed to extend the life of the facility.

Then you might ask, what of renovation? Can this program be carried out independently of the other - here, I believe the answer must be no - for to renovate in the opinion of those experts I asked, is a larger undertaking involving demoiition and major changes in the structure of the building yet without changing the use of the space. It is obvious, of course, that such a program of renovation must also include replacing fixtures, wiring, piping, floors, ceilings, wall surfaces, and re-finishing and equipping. So to sum up you can rehabilitate without renovating, but in a true renovation program, rehabilitation will be part of the program, if facilities are to be truly updated.

We have spoken of renovation, rehabilitation, alterations, updating. At the risk of further confusing you, I must bring in the topic of maintenance. A regular program of preventive maintenance augmented periodically with correctional maintenance, can delay the need for rehabilitation. This is most effective in the areas of surfaces - mechanical and electrical equipment and furnishings - no matter how effective it is, it can not prevent obsolescence, nor meet the needs of a changing curriculum, educational environment, or new concepts in teaching requiring use of new equipment, different techniques, larger areas. However, without a thorough and constant preventive maintenance program and a periodic corrective maintenance program, the approach of obsolescence much faster and the time of renovation or rehabilitation arrives much earlier, while at the same time the effectiveness of the facilities in the education process deteriorates rapidly with the resultant lowering of morale, increased absenteeism, loss of community interest and public support.

Having accepted the above as definition cf the topic, having cited the ingredients of carrying out a program of Rehabilitation and Renovation and having a knowledge of the implications of such a program, we can now apply this to a given situation.

In any school system, the need for a renovation and rehabilitation program is very real. It is only of late that we have begun to look on the problem with sincerity and interest. We have all been caught up for too long in the provision of additional school facilities to serve our expanding enrolment, our growing communities. We have been too busy designing and constructing new schools and planning for these facilities for years ahead, to concern ourselves with what has been happening to the older school building and facilities. We could be accused to a degree, of outright neglect. In our mad rush to provide the most modern of new school facilities in the new and growing area of our community, designed to meet the demands of today's curriculum and student and staff comfort at ever increasing costs, we have been creating an ever widening gap in the standard of educational facilities between the new and the old. We have created a situation which should be a real concern and I know it is too, where large numbers of our students are actually deprived of an equal opportunity in the learning process, because the facilities in which they must learn are lacking so many of the facilities equipment provided in the newer schools. This is the case of nearly all our schools in the core or older portions of our cities and towns.

We must accept the fact, however, that while our attention has been focussed on the need for new school-house construction over the past twenty years, it is just about all we could finance. The spiralling costs, and increasing enrolments have made it necessary to put all our eggs in one basket.

However, this need not be the pattern for the future. The levelling off of the enrolment, of which there are very definite signs now, the almost prohibitive cost of new land and construction, and the growing realization that we must make greater utilization of existing facilities and perhaps the paramount need to provide equal educational facilities and opportunities for students in our older schools, makes this a time to shift our emphasis.

The time is here for school boards to develop long range plans for salvaging our older schools by a determined program of rehabilitation, renovation, alteration and even additions.

Capital funds must be switched from new projects to reclamation of older facilities and definite priorities set.

How do we go about embarking on such a vast undertaking - it can't be partial - it can't be a hit and miss sort of thing - it must be dynamic, it must be designed to produce the kind of facilities that will restore and make the older school facility as effective a centre of learning as the new schools we are designing and building.

First we must establish criteria for change. This must be based on the educational needs in a particular location, being met by today's standards.

How this criteria is met will vary with each facility.

Steps in this process would involve the following:

1. Evaluation of the existing building - its facilities and grounds. This should include age (if over 35 years eligible for grant). Any existing capital debt should be taken into account. Doubtful is any would exist in an older building, unless resulting from an addition in recent years.

2. The educational needs and changing concepts would be one of the most important ingredients in the criteria to be determined. It is in this area that criteria will vary greatly from school to school

dependent on what changes have been made since the school was built. Here improvisation and imagination regarding utilization can be a big factor in the ultimate determination. Some buildings may lend themselves to easier adaptation of criteria than others, because of their design, structure and ease of entry or exit.

3. The growth patterns for enrolments in a given area, or over several school districts, will determine criteria to a great extent, particularly the size of the reutilized facility. Perhaps it should serve a wider area requiring boundary changes, and perhaps become a more specialized centre of learning serving the needs of a particular age group, or skill. Is it well located near to other facilities such as libraries, swimming pools, recreation areas? Are transportation facilities close at hand, is it accessible to adequate parking? Is additional land available for expansion of facilities, if necessary, or enlargement of grounds, if needed for recreation and play area. What will its cost of acquisition be? What of the changing character of the area - will urban renewal be a factor? Is the area still highly residential or is it changing to commercial - what of changes in traffic flow through the area?

4. An important facet of the criteria will require looking ahead and sensing future trends in educational concepts and techniques, and allowing for flexibility in the renovation or altering of the facilities of the school to permit adaption in future to changing needs and uses in the school building - this feature will be difficult in some ways due to the rigid structure design of many old buildings. However if these can be altered without too costly a program they can provide the flexibility suggested. Particular attention in this area should be to provide greater potential in the mechanical and electrical facilities to meet changing needs and greater requirements in the future. All of us are well aware of the overloaded electrical services and heating plants in our schools, restricting as they do the demands of today. So we cannot overemphasize this important factor of flexibility in arriving at criteria.

5. Criteria will most certainly be required to take into account the new open concept being designed into our new schools and the equal importanct to provide for this type of facility in our older schools. Then, too, there are the demands for team teaching, grouping, ungraded classes and all they represent in changing the physical character of the school house building. To introduce these facilities may well nigh be impossible in certain instances because of structural problems and/or cost, but we have to go as far as we can and include as much provision for these requirements as we are able.

6. Individual needs of the student and staff will have to be assessed in determining criteria. Adequate washrooms, staff rooms, storage, workrooms and offices must be strategically located. Adequate lighting, heating and air-conditioning must be provided and the comfort of all well served. Acoustic must be high on the list of considerations and elimination of interior and exterior noise.

7. In establishing criteria standards will play a major role in our decisions. Certainly the regulations of the building code - the Ontario Fire Marshal, the Department of Health, and the Department of Education will be given prior attention by the designer and architect. These may be restricted to a point but must be recognized, and abided with, they are the facts of life - and the present state of these standards constitute in many of our older schools a real hazard to safety and to health. In many of our schools today, the low standard of safety and health, as required by the above regulations, constitutes a reason alone for a comprehensive renovation of many schools, even to the point of condemnation and abandonment.

8. An element of the criteria that must be overlooked in today's concept of education is the need to make the school the centre of the community. Thus the facilities must not be designed for the exclusive use of children, but made so as to serve all ages of the community in all its many activities, education of young and old, recreation for all in all seasons both indoors and outdoors, a centre for creative arts, the platform for dialogue and the scene of citizen rallies, a shelter, a workshop, a service centre for the needs of children, parents and the community. To establish this element of the criteria will require more than a real measure of imagination and the acceptance of design features can service facilities not normally considered in just a schoolhouse.

9. And finally, and I guess last, consideration of materials, systems, finishes, surfaces, furnishings and hardware - and here the choice is pre-determined to a degree by the other criteria and demand of the facilities desired.

10. One overriding factor in setting any criteria is cost; and cost while determined by all of the above criteria, has but one final and deciding element - the amount of funds available. It would make no sense at all if the cost of any rehabilitation or renovation program,

excepting addition to a facility, were to exceed replacement costs of the facility. In fact, serious doubts should arise if these costs were to exceed by even a small degree, 50% of the cost of a brand new facility. We must be on guard not to exceed the criteria and make the whole project impossible.

Once the criteria has been set and applied to a proposal, then every effort should be made by the designer and the engineer to come up with plans and specifications to bring about the recreation of the facilities in the most attractive and sensible form possible and in a set time period.

Either school boards are going to have to develop a sensible program, of Renovation and Rehabilitation of Schools, or be faced with outright replacement at astronomical costs. Such a program, to be fair to all, must be undertaken soon and on a long range basis. In fact we have, in the past, paid little or no attention to the needs of students and the community, in older school areas. We have been caught up in the rapidly changing educational environment with outdated school equipment and furnishings, and suddenly we realize that we have a serious problem at a time when finances are tight and costs almost prohibitive.

Our problem in the older schools has been compounded by the short sighted educators of former years, and by the designer who built not for change, but erected an all too permanent structure designed to stand and stand and stand, impossible of change because of the basic structural design - great edifices of learning - great piles of stone, concrete and steel - cold dungeon-like fortresses - schools we called them, but not really any more.

This is a School Design Conference - our interest and attention while here will be devoted to developing concepts for new school designs or should we say, for design of new schools. The schools to be erected in the next five years, encompassing the ideas developed here and in similar conference, will, in forty to fifty or perhaps just ten years hence, be in need forrehabilitation and renovation.

So, I see an opportunity today, an opportunity to include a new ingredient in our schoolhouse designing.

- Design for obsolescence

- Design for ease of Rehabilitation and Renovation

- Design for change

To design school facilities with all of these flexible ingredients will be no mean task - but to me that is really what this Workshop should be all about.

I am just afraid that in today's school designing, like in the past, we will, and are, thinking in terms of what is popular now - of today's needs and concepts and not projecting our planning to provide for the changes of tomorrow.

We appear to make this mistake all too often in school designing - right now we are all hep on the open schoolhouse concept, and designing and constructing schools with this alone in mind; yet who is to say that in five years, like many other ideas in the past, it will be deader than a dodo - who is to say what comes next, but if we design a building why not a structure made for easy change, flexibility, renovation and rehabilitation.

WHY FIRE SAFETY DESIGN IN SCHOOLS
by J.R. Bateman

In considering the subject of fire safety in the schools, there is a rather striking feature of the fire record in this province, and that is the lack of facilities over the past several decades resulting from school fires.

Since the Office of the Fire Marshal has been approving new school construction for a little over one decade, we are really not in a position to claim credit for this record. This invites the inevitable question of whether fire safety standards are really necessary.

On the surface, this question is, of course, frivolous; the record of structural collapse in schools, to take an example of another type of risk, has been better than the fire record but the need for structural standards is unquestioned. However, it does serve as a starting point in any analysis of our fire safety requirements.

It is convenient to catagorize fire safety standards into seven distinct aspects of building design, even though the overall fire safety characteristics should be considered a system of interrelated components, like the completed structure itself. The first, and perhaps the most important, element in the design of a safe building is adequate exit facilities. Provision must be made to insure that the occupants can leave quickly and safely in the event of a real or imagined emergency,

The second is overall construction. In general, the larger the building, the more fire resistive its construction. A wood frame structure would be quite tolerable in a four classroom school but unthinkable in a 30 storey apartment. Third is compartmentization within the building to limit the spread of fire. Fourth, interior finishes, are naturally of concern since combustible wall and ceiling linings have played a major role in almost every fire where there has been a large loss of life.

The fifth category is adequate fire extinguishing equipment. This must be provided regardless of the other safeguards built into the structure. Sixth, mechanical and electrical services, represent an increasingly important segment of the new school plant and fire authorities must be concerned with matters such as patterns of air movement, emergency lighting, etc. Finally, fire alarm systems are required to alert the building occupants of a fire condition and, where necessary, to perform various auxilliary functions.

The original question, however, was not "what" do we ask for in school design, but "why"? The main reason is that, despite our exemplary fire record in schools, from a fatality point of view, we still continue to have fires in Ontario schools, some of them serious. There were 184 reported school fires last year, some of them serious, each of them potentially tragic had circumstances been slightly different. This is the unique characteristic of fire accidents. Unlike other risks and perils with which our physical world confronts us the nature of the unwanted fire is extremely difficult to predict. We can reasonably accurately predict the consequences of a punctured tire to an automobile moving at 70 m.p.h. We can very accurately predict the result of a broken cable in a suspension bridge.

Fire, however, is more mysterious, despite the tremendous technological advances that have been made in the past twenty years or so. Of the 184 school fires we experienced last year some were minor and some totally destructive - the average loss was about $7000. All involved the simultaneous occurance of certain conditions which permitted ignition to occur, and a further set of conditions which permitted the fire to develop and propogate. In real buildings, as distinct from models used for research purposes, the number of different combinations of circumstances is almost infinite. Under certain combinations disastrous fires will occur, and under certain combinations fatal fires will occur. Such a combination of circumstances did occur on the afternoon of Monday, December 1, 1958, in Our Lady of Angels Separate School, in Chicago. Ninety-five people lost their lives in that fire.

Despite the problems in anticipating the behavior of fire and smoke we do know that the proper design of buildings, and careful selection of building materials, can largely control the threat to life and property. To be more specific, an examination of some of the more obvious safety requirements pertaining to school design might be useful.

Why, for example, should stairwells be enclosed in smoke and fire resistive materials? There are two principal reasons for this requirement. The first relates to air movement within buildings. Any building, no matter what its size, has the general characteristics of a flue or chimney. There is a tendency for air to flow upwards via any route available, and this is particularly pronounced when the air is adulterated by warm products of combustion. For this reason an attempt is made to ensure that all shafts and vertical openings between floors are reasonably well sealed. The undetected spread of smoke is a potentially greater hazard in a school than in many other types of buildings. The school plant is relatively dormant for extended periods of time while classes are in session, interspersed with short periods of activity while classes change.

The other reason for enclosing stairways is that, as exits, they should provide a refuge as invulnerable as possible to smoke and heat. An

exit door leading into a stair enclosure should theoretically be comparable to an exit door leading to grade.

In the Chicago fire a stairway that was only partially enclosed permitting the smoke and flames to spread to the second floor relatively unhindered. And it was on this floor that all the death occurred.

The next requirements we might examine are ones that were originally controversial but have since been accepted as both reasonable and necessary. These are our standards on interior finishes and, next to exit facilities, represent the most important aspect to life safety in building design. We were particularly concerned with one of the staple materials of the Canadian building industry - low density, wood fiberboard.

Now fiberboard is, in many respects, an admirable product. It is an excellent insulator against the transmission of both head and sound, it is easy to work with and it is cheap. On the other hand it tends to kill people when it catches fire. This side of its personality was known long before we started approving school construction, but I believe our office was the first building authority, at least in Canada, to restrict it from large areas of new construction. Since that time we have seen low density fiber acoustic tile play an important role in the Chicago school fire (95 fatalities), the Golden Age Nursing Home fire (63 fatalities), the Hartford Hospital fire (15 fatalities) and the Workmen's Compensation Board Hospital fire in Toronto (1 fatality). Our present Standard does not permit the use of this material at all in buildings subject to our approval, except as external roof insulation.

Our requirements relating to mechanical services are perhaps a little more obscure than design criteria relating to exits and construction. However, it is clear that heating and ventilating systems are important factors in controlling the movement of air within buildings, and for "movement of air" one can read "movement of smoke" under fire conditions. It seems that the more we learn about building ventilation the more we realize how little we know. Nevertheless, it is true that, in modern buildings, fire prevention standards are tending more and more to become smoke control Standards. The most obvious example of bad ventilation design is the use of corridors and other means of egress as return air plenums. Most building codes and standards now prohibit it.

We have standards on standpipe systems but, in schools up to four storeys in height, do not insist on this type of protection unless the local fire department wants it. The fire departments are, after all, responsible for fighting any fires that might occur, so we feel they should participate in decisions on the fire-fighting equipment which will be available to them. We do not believe in the principal of local discretion, however, in the matter of fire alarm systems. Prior to our involvement in school approval many school boards were content to protect their students and staff with hand gongs that could only be heard in the immediate area, with P.A. systems or with glorified doorbell systems. Some schools did not even have a token fire alarm system. Now we ask that all schools, other than single classroom buildings, have a fire alarm system; that in schools up to 6000 sq. ft. in area the system may be manual; and that in schools over 6000 sq. ft. it be electrical, with all components listed by U.L.C. and detection in hazardous or unsupervised areas.

The key to a fire alarm system's effectiveness is an effective fire evaculation system. Fire drills are required by the regulations under The Department of Education Act, at least once a month in elementary schools, and at least five times a year in secondary schools. The fire evaculation procedure in the Chicago school had some flaws. About 12 minutes elapsed from the time the fire was first discovered until the alarm system was actuated. That made the difference between life and death for 95 people.

There is much rhetoric and publicity these days given to new trends in school design - striking new architectural innovations that will revolutionize the learning environment. However, if a visitor from another civilization were to tour this province and, from personal observation, make an assessment of recent trends in school design, he would be forced to the conclusion that the school of tomorrow will consist of a cluster of portable classrooms. They are certainly the school of today and, for that reason, a comment on how our standards are applied to portables might be warranted.

In general, they are treated just like any other school building. A number of portables grouped close together so that a fire in one would involve the others are treated as one building and, for example, the appropriate construction and fire alarm system requirements would apply. If they are spaced relatively far apart (e.g., 40 ft) they can be treated as separate buildings and because of their small floor area, would be subject to less rigorous standards.

One point should be made quite clear concerning portables. We do not consider them temporary.

Apart from the portable classroom phenomenon it is a bit frightening to contemplate some of the directions that school design is going to take in the next few years. The trends are predictable. There will probably be multi-occupancy building complexes including apartments and stores as well as schools. The plastic bubble approach and air supported structures have a following (some day we may have whole cities enclosed by these bubbles); many architects have been converted to the gospel of the completely flexible building (no permanent partitions and nothing to define corridors); they are talking now about disposable buildings having a life span of 5 or 10 years (perfectly adapted to the North American way of life). Much of this is perhaps wild speculation at present but it does indicate some of the drastic changes that we must expect in the building industry. And these trends pose a very tough challenge to those of us who are entrusted with the responsibility of ensuring the safety of the public in these buildings of the future. It is a challenge which must be met with flexibility and firmness, with imagination and common sense, and with technical knowledge that can respond to the rapidly changing building technology.

It is a challenge that makes all our jobs interesting.

SCHOOL HEATING SYSTEMS
by W.H. Jacobsen

Over the years, three major changes have taken place in the heating industry.

When the coal stoker was reigning supreme, many people found the clinkers to be a hinderance to dispose of. This made many changes to oil heating.

At this time, the change over was a major part of the heating contractors' work, and many fly-by night operators wanted to get on the bandwagon. This also was very true, when the natural gas line came through.

This meant that many poor installations were put in for a price. We realize of course, that excess air is the biggest offender in any heating.

Today, we have oil heating that really is amazing and unbelievable. We have the advantage over gas, inasmuch that we do not need combustion chambers anymore, saving expensive brickwork repairs intermittantly, as today's oil burner operates at 300 lb. pressure. This of course, atomizes the oil much finer, and we refuse any test below 84% CO^2.

This was unheard of five years ago, when we would readily accept 80% efficiency. This 84 and 85% is achieved and maintained through a completely sealed furnace or boiler with what is known to the trade as "No 1 Smoke". No 1 smoke is absolutely no smoke on the tester, and this keeps the equipment at peak operating efficiency. When you do not have a combustion chamber, all the heat is transferred immediately into heating the equipment instead of heating a large amount of brickwork first. Proper combustion does not take place in equipment that requires brickwork until the bricks are cherry red. This of course is wasted B.T.Us.

As examples, we have converted a few schools to oil firing from coal, have matched the coal price, and no clinkers to handle.

The oil burners need no liners in the chimney as the products of combustion do not attach the mortar or bricks as other products do.

We also know that we renew a lot of boiler tubes in the area that is fired by other methods. This only stands to reason. If you were to purchase gas unit heaters, you would find that steel heat exchangers were considerably lower priced than aluminized heat exchangers but, in the

long run, the aluminized unit would be the least expensive, as any steel heat exchanger can readily burn out in a very few years. Oil, in a raw state will not burn. It must be atomized, and this is only achieved by the fuel oil pump or by the old pot burner that heated the oil until it evaporated.

Can you find a fuel as safe then in regards to any accidents happening?

We do not require expensive insulation and make a positive vacuum of a building to heat it. We believe that any school should have positive ventilation, and keep the high humidity down. We do have the infiltration from a well constructed building to help us, but, we also require fresh air to be heated and then supplied to individual areas for freshness.

We hear of the cleanliness of other types of heating. This is as true as what any salesman can hope to be able to prove. Air is heated and any air in motion will pick up surface particles and streak with any type of heating.

The oil industry has gone much further in a new line. A new non-combustible oil is used now in lieu of water as a circulator, and is called "Vapower".

They have the proof of faster pickup and have positive proof of savings of 20% over other heating systems. This is worth looking into.

The Bergen High School in Peoria, Illinois, went to a complete oil operated school. They have diesel generators using No. 2 fuel oil, for their complete operation of electrical, heating, refrigeration and hot water or cool water operation. Their costs are shown in a reprint from the January 1966 issue of American School & University, with fantastic savings, and it appears this is going to be the trend for any future schools in this area. They have three generators and use one as a standby. Their findings, considering all costs, such as fuel, maintenance, personnel etc., that costs are about half those of comparable schools that do not use total energy.

Then, in a quick summary of what we have to offer in oil, less expensive construction, because of the lower priced fuel. If we insulate a school, to electric specifications, then heat with oil, certainly the costs will be much lower for fuel.

The oil storage is positive, and leaks in tanks are caused by not keeping the tanks filled in the warm weather, and when it cools at night, condensation will enter, causing water in the bottom of the tank. If they are filled in the spring and left full, a tank will never rust out.

The oil burners of today have singled out to a quick acting group of controls, and are as positive and safe as any program possibly could be, and they are very easy to service.

We find by removing surface lint, etc., once a year, renew the oil filter cartridge, and you are away for another year of carefree heating.

Personally, I've had oil in my home for 19 years now, and have had three stoppages in that time.

You may note that I have neither condemned nor cheered for gas or electricity, but we know they both have their downfalls.

We know that in the long run, oil heating is by far the most safe, the least expensive, and the best heating system available today.

NATURAL GAS IN SCHOOLS
by F.J. Dunn

The continuing inflationary trend in our economic life that we see today throws out a tremendous challenge to school boards, architects and consulting engineers. They strive to design functional schools to meet the ever-increasing demand for more and better facilities for educating the young, the adolescents and adults, at costs within the budget limits of municipalities, the Province and the Federal government.

Natural gas fired equipment provides the planner with an extremely wide range of design possibilities that can be tailored to provide the proper type of heating system; ensuring economy in initial cost, and year to year operation and maintenance savings.

Let us review the types of equipment and heating systems that are available.

1. Standard Hot Water or Steam Heating System

This is the type of system well known, proven effective over the years. The modern addition of the unit ventilator provides continued supplies of fresh air to each classroom enhancing the learning environment.

As you well know, this system is supplied by a gas fired hot water boiler, the selection of which provides two main alternatives to the planner. These two types are classified as follows:

(a) Packaged - large capacity type boiler
(b) Packaged - low capacity hydronic boiler

(a) Packaged - large capacity type boiler used where system design indicates the size of boiler. Due regard is given to possible expansion of the school premises plus alternative or stand-by capacity. Thus we may find that if a capacity of 150 horsepower is required, then possibly 2-100 horsepower boilers would be selected. I term this type of boiler as large capacity due to the actual volume of water contained. These boilers which are available for steam or hot water are efficient, and will provide many years of trouble-free operation.

(b) Packaged - low capacity hydronic boilers
These boilers differ from (a) above in that they are small and water capacity is low. The main feature is that multiple installation is recommended thereby ensuring that only the capacity required for heating is used. On sizing such installations, if 150 horsepower is required, then 4-40 horsepower boilers would probably be specified. During periods of low demand, such as spring and fall, one or two boilers only would operate and provide sufficient heat to meet demand. This arrangement lends to overall higher system efficiency and in turn lower operating costs.

In addition any failure to one boiler would not shut down the entire heating plant. Furthermore initial costs of such equipment is found to be less costly than (a) above. Although they are not as rugged, experience indicates a good lifetime and replacement is easy.

These boilers can be installed in a very small area as they can be mounted one on tope of another. For both (a) and (b) roof top installation should always be given consideration in order to cut down on chimney costs, and more important to free boiler room area for a more useful purpose. A housing for such equipment can be erected relatively inexpensively and be designed to blend in with design of the school.

2. Individual Gas Fired Unit Ventilators

Such heaters are available and are in fact enclosed type gas-fired warm air units which like the hot water unit ventilators mentioned above, have facilities for introducing and tempering fresh air as desired. All the air required for combustion is drawn from the outside. The unit features an exclusive indoor-outdoor control assembly that modulates dampers automatically to assure the proper blend of fresh and recirculated air. Here then is a package that can provide not only adequate heating but also the atmosphere essential for efficient teaching. The heating ducts conveniently run behind shelving, so in addition to efficient heating, book shelves are provided, and so reduce the cost for such equipment. An added advantage is the elimination of space for a boiler room, stack and cost of same. The units come completely packaged and are available with adequate input ratings to heat the average classroom.

The only problem appears to be the current regulations on school heating systems, which will receive approval by the Ontario Board of Education, who adopt those laid down by the office of the Ontario Fire Marshal. The objections were overcome in another Province where it was agreed that if the units were installed in accordance with the CGA, CSA and local gas code, they would be accepted. In these cases it was ruled that the gas piping be run underground around the perimeter of the school and entry to each heater made above ground.

There seems to be no reason why if such an installation were designed in this area and submitted for approval that it should not receive

favourable treatment. We as a company will certainly support any such design and I am sure we would be able to solicit the support of other gas utilities as well as the Canadian Gas Association.

3. Roof Top Mounted Heaters

This type of heating unit, as its name implies, is installed on the roof of the building and warm air is ducted to the spaces required. In addition cooling is available utilizing air cooled refrigeration to provide individual zone control year round.

Roof top mounted heaters have all the advantages of individual classroom heaters discussed above except the provision of shelving and would probably be equivalent in overall cost. Certainly it has much to offer as no space is lost in the classroom areas for housing of equipment and maintenance is very simple. Each unit is completely weatherproof and needs no housing. Likely, however, is the provision of housing to protect a serviceman from the weather. The writer has yet to find where this has been provided to date.

Some manufacturers provide flexible ducts which enables the school to install movable partitions for classroom area. The ducts can be moved within the space above the false ceiling and continue to provide proper heating conditions if classroom sizes have to be changed for one reason or another.

Individual zone control is provided and all air for combustion is drawn from outside. In addition through damper control fresh air is drawn in and added to recirculated air to provide a continuous source of fresh, clean air so necessary for good teaching and learning environment.

With this type of unit the approval of the Ontario Fire Marshal must be obtained but in this area a school was completed a year or two ago using roof top units. They received the approval of the Ontario Fire Marshal which indicates such design should be given consideration.

Before leaving items 3 and 4, it is pointed out that in the ever-increasing demand for additional classroom facilities, on existing schools, it is found that the heating plant cannot be extended either by lack of boiler capacity or system capacity, without considerable and costly alteration. The use of the individual gas-fired unit ventilator or roof top unit can be conveniently and economically installed to heat such additions.

4. Total Energy

This concept briefly utilizes the shaft power of a gas engine or turbine to provide electric power requirements and extracts heat from both exhaust and cooling water to provide building heating process steam and water heating in winter, air conditioning process steam and water heating in the summer. We have a limited number of copies of a paper written by Northwestern Utilities Ltd. giving details of such an installation made in Hillcrest Junior High School, Edmonton, available. This is well worth reading and the economics can easily be transposed to local conditions, such a system, particularly in a larger school complex should be given some study by planners.

5. General

The foregoing has dealt with heating but I would be remiss if I did not point out other uses to which gas can contribute in the overall planning of a school.

Many schools today, in fact it is probable that most schools today provide laboratory facilities for the students where the use of the laboratory bunsen burner is a necessity. In technical schools, particularly where shop subjects are included in the courses offered, gas finds its place in forges, heat treating furnaces, metal melting, ceramics, torches for cutting and brazing. In the Home Economics rooms, gas ranges are provided on a free loan basis by Northern & Central Gas Corporation - Twin City Gas, for cooking. While in the Home Economics room you may provide washing and drying equipment; matching automatic washers and gas dryers are available.

Another major use for gas is in the water heating where convenient packaged gas fired units in a very wide range of size and capacity is available to provide for water heating facilities in washrooms, showers in the gym, laboratory washup sinks and cafeteria purposes.

Many schools today are provided with cafeterias and the vast majority of kitchens use gas for cooking, baking, coffeemaking, deep fat frying, broiling and as mentioned above, for water heating to the slop sinks, hand washing and dish washing.

Incineration is another area where gas provides the much desired smokeless effluent from the disposal of all kinds of waste material from paper to wet garbage. The manufacturers of incinerators are all well aware and do design gas burning equipment to fire incinerators.

While on the subject of smokeless effluent, gas is to be desired due to the fact that in whichever manner it is used, the results provide merely harmless water vapour and carbon dioxide to provide clearer atmosphere to which we all work towards today.

I should not leave this entire subject without a word on safety and you will find that in all reports, gas has the highest safety record of all fuels used in Canada, not merely in numerical statistics of incidents but on the basis of per thousand users. Together with this we can quickly combine the economical value where natural gas is ahead of any of its competitors in costs of operation, paid for by school boards and in turn, the taxpayers.

The foregoing briefly presents what natural gas can and does do and I am sure provides a wide variety to assist the planner, no matter what type of school, or school addition, is projected.

EFFECTIVE USE OF SCHOOL SITE

by C. Man

After some contemplation, it would seem that there are two obvious ways this subject can be approached. Firstly, I could discuss standards; for circulation, facilities, orientation, buffering, etc.; or, I could discuss the theory of effective use of site. I have opted to consider the latter.

As well an excellent brochure has been prepared on the first subject, standards, for the Ontario Department of Education by Michael Hough & Associates, in which they discuss facilities that must be provided to fulfill the objectives of modern education at the least possible cost. This brochure titled, "Site" considers the following subjects:

1. The integration and organization of community and school facilities in order to reduce land and development costs.

2. Site selection criteria that indicate the type of site best suited to fulfill school programs.

3. Various site uses and their relationship to each other.

4. Site area requirements.

5. Design criteria that illustrate problems and the principles involved in their solution, including pedestrian and vehicular movement, parking, visual space, planting, lighting, and other landscape elements, and factors relating to maintenance,

I can only re-emphasize that this is a well-done brochure and should be considered by any school board prior to committing themselves to a new school building program.

As I have said, I am going to consider some of the theory related to effective use of site and the planning, sociological and cultural considerations that should be a part of the development of any school site. Thus, I am going to firstly consider some of the historical aspects.

Not many of the bright hopes that the nineteenth century held for the future have been realized. There is little in common between the world we inhabit and the paradise of rationalism and technology our forebearers dreamed of. Yet, in one case they had the gift of accurate prophecy: they prophesized that our's would be the century of the child.

For in any one sustained purpose can be said to inspire all our efforts to right society and improve the environment, it is our concern for youth: it's health and happiness and opportunities for full development. It has often been remarked that we seem to have lost the gift for devising social and economic utopias. But by way of compensation, we have attempted not only to design but to create down to the last detail, utopias for childhood - places which are safe and healthy and beautiful. True, these are almost entirely suburbs and family-type summer resorts, but what other age has done better? Innumerable communities exist, especially in North America where the child can play on expanses of lawn without fear of being run over, where he has easy contact with nature (constantly diminishing, I might add) and a home adjusted to his needs; where there is the best school money can by, and where he is exposed to no contamination from the adult world of politics and work. It is appropriate that the ruler and protector of these communities should be a child-oriented, a political figure, the housewife, who divides her almost limitless energies between running the Boy Scouts, agitating for birth control, and fighting all non-conforming uses of land.

That it is better to have children happy, safe and well, instead of neglected, should go without saying. But even these good intentions can be carried to excess; other parts of the environment need care. The child-centered society can easily become a biologically centered society, a society obsessed with the sanctity of life without bothering as to its meaning and end. Thoreau's nonsensical boast that he preferred man as part and parcel of nature to man the member of society is already far too widely accepted. In terms of the environment and its reforming, the primacy of the child means that social changes takes second place and that man-made beauty comes last of all. Intellectually, the North American public knows that our environment must incorporate social justice; we also know that public art is an essential ingredient of our culture; but, what finally arouses us to action is the discovery of a wide-spread menace to health. If any prediction can safely be made, it is that we will still have slums just as evil as now, long after our river and beaches are relatively clean, and the air in our cities relatively pure. Because the health and well-being of our children is at stake. And as this biological awareness becomes more general, it will increase its area of concern to include not merely the domestic environment, but the environment of leisure and even the environment of work. We can foresee in the not very distant future, a North America transformed. Our cities will be no more splendid than they are now, but they will be clean and cheerful and safe; the social order will still be without justice, but it will be clean and cheerful and safe. There will be no monuments or ruins to recall the turbulent past or to suggest the vanity of our hopes, but it will be a pleasant world with only the faintest taint of behaviourial science and chlorine.

Now what is the role of the environmental designer in this child-oriented world? I would contend what it has always been: to satisfy the demands of his patrons as best he can. Whatever his aesthetic or social convictions, he has to learn to mobolize the aspirations that exist, not those that textbooks tell him ought to exist. Environmental philosophy largely based on ecology, as the absence of conflict, is necessarily indifferent to art and to social reform. Even so, there have been worse philosophies: national grandeur and the pursuit of wealth, to specify two. But the designer must learn the rules of the game: to advocate decent housing, not because slums are an indignity but because they are potential centres of infection; to condemn the ravishing of the countryside not because this is wasteful of an important resource, but because recreation sites are imperiled. The designer will thus please the embattled parents, the conservationists, and presumably benefit the child.

Ingenuity in devising justifications will be needed, but designers in the past have been faced with the same problem of satisfying their patrons while at the same time remaining true to their inner convictions. Provided he pays lip service to the principles of ecology, the contemporary environmental designer is as free as he ever was to create in terms of humanity and his art.

Perhaps we can find the glimmering of an approach by what is happening in the field of city planning in the United States. This can best be described as a kind of applied behavioristic psychology. What gives this new approach the possibility of a distinct identity is its rejection of any model.

The fundamental part of the planning process is finding out "what needs and desires exist". Here the sociologist and psychologist enter the picture; to provide the background the planner must have. How does the individual respond to certain types of environment? How can an environment be designed that encourages a more meaningful relationship between site and user?

It is this new emphasis on the individuals response to his surroundings - natural or man-made - which makes the current approach to city planning so full of promise. Thus what should our approach be to site planning for effective use of school site?

It would seem that we must consider:

1. Effective use of site in terms of economics.
2. Effective use of site as a teaching resource.
3. Effective use of site related to the "safety syndrome".
4. Effective use of site as a community asset.

And then we should undoubtedly look at the future before summarizing.

I have chosen to speak of economics first, because this is becoming more and more a pressing issue with the increasing high cost of education in all its aspects. In many communities, the school facilities are the greatest public expenditure made by the community and consequently warrant very serious reconsiderations. Far too frequently the wrong piece of land winds up as the school site. To enlarge on this point, I might point out that in our practise we work not only with school boards but land developers and city planning agencies. We know how the school sites are determined in the land development process. We know how the school locations are considered by planning departments. How often have you as members of the school board or as members of the teaching profession ever been consulted by a land developer or city planning agency on the suitability of a specific piece of land; or are you as most, shown a land use map locating the schools, a land use map prepared either by a private consultant or by a city planning agency or equivalent provincial agency indicating the school sites that are going to be available for your use? In many cases, it is almost impossible for you to check that particular piece of land as it is presently a wooded, undeveloped, or a remote area. So in essence, you accept a "pig-in-the-poke". The criteria used in determining that site is usually a distance factor based on density, access factors, and far too often the most undevelopable piece of land which the developer has instructed his consultants to designate as school site because it would be an extremely costly site for him to build on. I would strongly recommend that all school boards request their property committees to be advised of future school land by the city planning committee and, in essence, have their approval on sites prior to them becoming part of the official city plan. Secondly, that alternative sites be designated so that they have some choice when the time to build arrives.

The next logical question is that how do you know which is the ideal site? I would strongly suggest that you don't, not until sufficient inventory and site analysis has been done to determine what you are getting. How often have you found, much to your dismay, that after the project has been started you hit underground water, rock outcropping, or silt pockets, etc. All supposedly unknowns which ultimately up the cost of your structure. As you know, soil borings are normally done before the building is put out to tender. But, these are kept to a minimum and are normally only taken in the areas that have been designated for actual construction. Three soil borings taken at 100 feet on centre might give you an indication of what the soil conditions are. But, on the other hand, the silt pocket may lay right between the borings, and thus you find out, at your cost, after the particular construction is started.

This is a rather archaic way of determining site construction suitability. But before the advent of better techniques, it was the only technique available. Shortcomings of this particular technique are:

1. You have already made the decision of where the building is going before you request the soil borings.

2. Cost prohibits a thorough testing.

3. The boring equipment has probably desecrated a fair amount of the site only to find out that the particular portion of the site is not buildable.

A far more efficient and meaningful site exploration can be done on two levels:

1. Air photo interpretation.
2. Site analysis by a person trained in the technique of site analysis.

With the advent of improved techniques in air photo interpretation and the use of infra-red films, it is possible to determine underground water sources, silt pockets, bedrock, rock outcropping, general drainage patterns, soil type, soil depth, and location. As well a trained site analyst can, from certain "tells"; (for example, a particular tree pattern or tree species will indicate a particular subsoil water condition) predict subsoil conditions, soil type, and in some cases identify permafrost and other difficulties. This type of site analysis can be done on very difficult terrain or heavily wooded sites without destroying the site in the search to find out what happens beneath the surface. It can also be done at a cost approximating soil boring, which as previously stated, gives you a very limited insight as to the character of the subsoil and the site. As well, the site analyst can analyse for the specific function; that of a school, and determine a suitability of various portions of the site for the functions normally attendent with good quality school development.

Along with the normal haphazard selection of site, we then see in many cases, the complete destruction of site. This is partially the result of the historical planning approach and in many cases, lack of understanding of site potential. Traditionally, the first operation on a site after soil boring or sometimes even before, is complete bulldozing and clearing. This, of course, seems to be predicated by the desire to create a billard table surface for the forthcoming ediface. As most schools are designed for flat sites, and have been traditionally, there is normally a request to provide a flat building podium. This is done on a levelled site. The net result of this operation is normally less than a balance of cut and fill and you pay for spoil from other sites to be spread on the school site, spoil normally of a very poor grade, or you haul away and pay for disposing of part of the site. Now that you have created a level site, you have the attendent problems of drainage.

Consequently, you are increasing your drainage costs. Apart from these economic considerations, you have probably destroyed many of the teaching resources which you could have had at no cost. Thus, it becomes evident that you have to identify your resource areas. This might consist of, a small stream, a piece of wetland, a promontory a well-wooded copse, each of which can provide a valuable teaching resource, which I will deal with later in this paper. Also attendent with this denudement is the "visual scar" which is disruptive in terms of the neighbourhood and leads me to the next issue, that of land values.

It is a heavy enough cost for a community, to have school land removed from the tax rolls; but to depreciate adjacent land values seems to be paying doubly for a situation which should not occur. I know from constant contact with land developers that the property adjacent to schools is normally discounted approximately 10% in order to make it marketable. The net result of lower cost land is normally a lower cost unit which results in a lower tax base, based on our present mill rate system. So, by needlessly creating school sites that are visually dismal, we have depreciated adjacent land values and pay for this year after year in a reduced tax structure.

While on the subject of economics, the basic question that immediately comes to mind, is can any community afford a "nine to four" facility which is only used approximately nine months of the year? Thus effective use of site also includes extended usage of that site. This can be brought about in several ways.

1. We can provide facilities for community use. The athletic facilities or "the organized sweating areas" have to be of a caliber to be used beyond school hours.

2. We can combine school and park sites. Apart from multiple use of land, parks seem traditionally to be visually more acceptable than the traditional asphalt paved, chain-link fenced school site.

3. Another possibility, of course, is the education-park concept. A concept which includes multiple community resources, as well as the bare bone school education system. This can include other resources such as library facilities, park facilities, audio-visual community facilities.

It seems that we have extended the one-room school concept to the multi-roomed school without integrating the school truly into the day by day functioning of the community. We've created one-room school concept reserves which are apart from community rather than of community. In most cities we have a conflict between school board and park board - who maintains what? This particular piece of political rigor mortis costs most of our communities dearly day by day.

But as I've previously said, economics, although not umimportant, is only one factor in effective use of site. Inasmuch as we are discussing the issue of effective use of school site, I will stress school and accept that the primary function of school is education. Obviously the factors involving the quality of education are of equal importance to that of economics. With this in mind, then I would like to discuss site as teaching resource.

The obvious, of course, is the outdoor classroom, which may take many forms. If properly handled, various outdoor classroom extensions can provide group discussion space, specific activity space, including such items as, art education, music education, drama involvement and creative leisure time. A normal resistance to this type of thinking is that our school season is so short that there are so few days in which these classrooms can be used they don't warrant inclusion. My point has always been that they provide an opportunity and a possibility at a minimal cost of providing these facilities indoors. The other issue which, of course, comes into mind is how long we can afford to have that school, all those schools, stand empty for a two month summer period. It is not my intention to get into the staggered class issue, the year-round issue, or better utilization of the existing costly facilities; but only to point out that the schools you build today are going to be with us for thirty or some years and if education techniques change as they have in the last thirty years, don't rule out this possibility.

Another distinct possibility especially at the early year classes and particularly in the urban areas where we have a great number of apartment dwelling students, is the school garden plot. As proven by many of the European examples, particularly in Switzerland and Germany, the school garden plots are very much a part of the total teaching process and in many cases, provide the child's only contact with the food production cycle. As well, the development of school garden plots can instill a sense of respect for communal property, which I will dwell on later.

The next obvious area of site utilization is in the nature laboratory. It always seems ludricuous to me that we destroy existing site ecosystems and then bus children at great distance to see nature and study certain aspects of nature when this could have happened at hand and been a more meaningful repetitive contact.

The ecology for instance of a wet marsh can provide a bonanza of entomological species, botanical species, and a limited range of zoological species. The observation of these ecosystems in their

life cycle over a sustained period of time is of considerable more value than a one shot explanation. Similarily, sustained experiments of the insertion of outside factors into the system can be observed and studied over a period of time. The study of a micro-system in its natural habitant is infinitely of greater value than the plant experiments carried on in the classroom.

Any discussion of site as teaching resource would be incomplete without discussing the physical educational aspects of site. As previously mentioned, these are of greater import if they have an extended usage byond that of the normal school day and the short physical education period. We have recently seen a national consciousness and awareness of our shortcomings in the athletic endeavour field. I fully realize that many factors have contributed to our apparent lack of athletic prowess. These, of course, being a rather severe climate and limited access to facilities, limited trained personnel to instruct in these areas, and a great shortage of first-rate facilities. Thus, as in the case of any issue of national concern, correction must start at the grassroots; and, of course, again another onus on the overtaxed school system. I would contend that the average school site is miserably equipped to take an active role in this particular endeavour. Most physical education activities and athletic activities have as specific requirements as any other curriculum item, and again the cost of providing these is minimal related to the equipping, say, of a science laboratory. Yet, we have traditionally neglected this major area. Rather than dwell on the specific requirements for each type of activity that might be beneficial, I would suggest that it is sufficient to point out that this is an area that has had far too little consideration, and point out that the information and requirements on the specific activities are available, if from no one else, the sporting goods suppliers.

Another major area of site as teaching resource has been completely ignored. This relates to the concept that play is a learning process. The child meets a challenge and conquers, learns how to grapple with that particular challenge and moves on to greater challenge. This is the essence of play. The distinction between play and work is not very clear in the mind of the child, and in essence, play is his prime area of concern. I think traditionally we have thought of play as a form of recreation or leisure. In essence, we have given an adult value to a child function.

So, play is part of the learning process. It is fair game within the school system. Perhaps we should dwell for a moment on the subject of play. What are the components of play? Play is:

1. Discovery
2. Development of motor responses, or commonly called co-ordination.
3. The ability to entertain or amuse oneself.
4. A method by which we learn to relate to others in a social sense, and develop basic team endeavour.
5. Most of all play is fun because it is exciting.

So what do we provide in the way of play? We know that play is both active and passive. Yet, we provide very little in the way of passive play and concentrate on active endeavour. Passive play includes discovery of perhaps, a frog, the discovery of a space that provides a private world for the child. In a sense we have failed to capitalize on our site liabilities. We've filled in that small valley that existed, or levelled that hill that existed. We've cut down the forest, supposedly in the name of safety. When it comes to active play we've provided a lot of standardized play equipment, swings, slides, teeter totters, merry-go-rounds, sandboxes, etc. Most of these look like they have been designed by the school janitor. In general, pretty dull. I would contend that any child that can be happy running up the stairs of a slide, to slide down, to make the circuit back to run up the stairs to slide down, for more than about two hours, is short on smarts! In essence, most of our play equipment is a drag. The rationale seems to be that it is perfectly safe - the child won't harm himself. Which brings me to the next major issue, which I refer to as the "safety syndrome".

In the rationale of safety we have created chain-link jungles. We flatten the site, leave it as either a gravel lot or perhaps a paved lot completely surrounded by a ten foot high chain-link fence. Supposedly this keeps the children from inadvertently dashing out on to the street. I suppose, conversely, keeping undesirable elements out of the school site. Whatever the reasons, the outcome is a rather dull and unattractive prison aspect. Secondly, I would contend that this creates a physicological barrier and puts the school even futher off from the community. Frankly, I have seen prison farms that are more attractive than the average school site, and with less fencing. Are our children so ill-equipped to deal with the world that they have to be protected and barricaded in? If so, society is failing miserably.

We lament the incidence of vandalism in our communities. Much of which is carried out by school age children. It seems mother is so busy agitating for birth control that she doesn't have time to teach respect for community property, and father has become merely a grocery account. So another responsibility has been shifted onto the backs of the educators. The question I ask, is how do you teach or instill a sense of respect for community property in the context of

school that has a gravel lot, chain-link fence, and indestructible building materials? I use the term indestructible with certain reservations. As we all know there is no way we can make a school indestructible or beyond the realms of the vandalism. Again, the Swiss perhaps lead the world in this regard, in that they provide a perfectly normal community situation around the schools and they do attempt to instill this respect for community property. It seems the theory is that there is no quicker way to teach a child to respect the property of others than to have others not respect his property. In conjunction with the garden plots, they seem to have instilled respect for other people's property by pointing out that the fun game of stealing someone else's carrots is not so much fun when its your carrots that are stolen the next day.

It is perhaps enough to say most of the dismal failures in the use of our school sites have been rationalized on the basis of safety. Thus, we have to consider the site not only in its purely teaching functions but as a community asset. This obviously has a functional and visual component. In terms of the functional, it becomes evident that effective use of the site must include the use of the site on a more sustained basis. As previously mentioned - can we any longer afford to use the school site on a nine to four basis? Thus we must provide for this extended use for community needs and desires and it will probably include multiple use facilities, facilities that are not only used during the school day but after school hours. One minor element should also be considered, that is the requirement for parking. Teachers are humans and teachers have cars, and do require facilities to park in. Similarily, the extensions we discuss will require parking for after hour use. Undue encumberment of the adjacent streets for use as parking certainly detracts from the useability of the surrounding community.

This, of course, ties back into the theory that we should not depreciate the surrounding land values by this imposition of the school within the neighbourhood. By making the same school site particularly attractive, it can encourage adult use. At present there is very little on a school site that would encourage an adult to make any use of that site. Similarily, if site is attractive, it can instill a sense of pride by the community in that particular facility. I would content that this makes the school levy slightly more palatable.

Now let us take a short look at the future. As previously mentioned, the school you build today is going to be with us for several years. But to quote the idiom of the campus activists "the times they are a changing". Thus, how are we going to use our schools in the future and what role are they going to play?

Firstly, we are going to have to quit paying lip-service to the school as community facility and make it actual fact. A total community facility used by all with extended hours and with a greatly extended range of functions. As schools in the future will probably have to fill the needs of education for living rather than making a livlihood, leisure time becomes particularly more significant and site becomes useable for this particular function. This gets us into the whole issue of education for leisure. A phenomina that the United States is finding particularly unexpected and putting particular heavy new demands on their education system. Mother is becoming involved, abandoning the T.V. set and the bridge circle to take education courses for self-satisfaction. Our enrolments in evening institute and summer course, I think is the first indication of what we can expect. Also because of the galloping rate of technological innovation, we find that most adults are technologically obsolete and we are going to have to undertake retraining, and in many cases continuous education in order to stay abreast of what's happening in the field of technology. This is going to bring tremendous pressures to bear on the education system and the school. The other educational resource facilities as discussed are also going to be a heavy load on a sustained basis whether we like it or not. Realizing this, we have to change the image of the school and that starts with the visual impression of the site.

We feel that there is going to be much more extensive usage of the site and it is going to require a different kind of site. A high intensity use facility, partially enclosed in some cases, appropriately sculpted and surfaced to take these expanded requirements. We are going to see site lighting to extend these hours. We are going to see the addition of site service facilities to make the site fully useable. And we are going to see the logical extension of the existing school space onto site because the facility developed on site is at a minimal cost of the complete enclosure of site in additional building. Also we are going to see a concept which has been kicking around for years come into effect. That is, the school as a generator of urban form. Planners refer to this as seed money; this is public investment in an area which can and does encourage investment on the part of the private sector. By locating our schools in particularly key situations, we can set the form of urban restoration or development that will take place in that particular area.

May I leave you with one rather perplexing question, one for which I have no answer? Consider national concern with the housing shortage, and the Canadian Conference on Housing manifesto "that decent housing is the right of every Canadian"; and just assume that the Federal Government through its housing arm, Central Mortgage and Housing Corporation, suddenly opens up the mortgage market to include old houses on the same terms as new. This could conceivably be done to

encourage renovation, restoration of existing stock rather than the continuation of urban sprawl with extenuated services; (and I might add, there is a lot of merit in this particular thought) suddenly, you have the middle class suburbanite, (I say middle class based on income level) moving back into the core of the city to take advantage of this new type of loan to restore some of the fine old buildings that have become soiled and worn. Suddenly, you are faced with an influx of children, and parents who have dedicated their entire existence to the welfare of their children, assessing your older facilities in the established core of the city. Older facilities with highly inadequate sites and no chance of expansion except at the cost of surrounding housing stock. How are you going to make that existing site meet the needs of these new demands?

So, in summary, I'd like to reiterate:

1. Analyse your sites before you accept them. Determine their capacility to support the facilities that you are going to require.

2. Develop site teaching resources, rather than destroying the potential laboratory and the potential excitement of the site.

3. Re-evaluate your sites in light of the safety syndrome. Have your school sites failed to meet their potential by reationalizing that this is the safest way of handling the site?

4. Seriously consider the future. We can be sure the schools and their function are going to be as different thirty years from now as todays schools are from what they were thirty years ago. Technological advance and the sume of learning is a geometric progression.

In conclusion, maximize your site potential and site use. It comes at considerable less cost than additional storage facilities.

USER'S REACTION TO CURRENT SCHOOL DESIGN

by A Senior Student

I find it a little difficult in this topic to know where to start and where to end. To start with - just what is current school design? We have about us now, open concept schools, modern schools, updated schools, renovated schools, old schools all in use. I am afraid many have been like Topsy - they just grew.

I would like first to make a few general points with respect to school design and procedures in design.

I do not think we need to apologize for requesting or building what a few may regard at the moment as frills. Yesterdays frills have a habit of becoming today's necessities. In this day and age even some of our more solemn and severe institutions of the past (hospitals, banks) have brightened up their premises and become cheerful comfortable places.

The school building is for many hours of the day a complete environment for students and teachers alike. As such it can exert an influence that affects feelings. Feelings can become attitudes. Attitudes can affect interpersonal relationships and these are extremely important when over a thousand people, most of them young, immature and impressionable work closely together in what may be crowded conditions in one building.

If a new building is in the process of being planned, from the user's point of view I would suggest:

1) The building must fit the philosophy or meet the expectations of those who are going to use it.
2) Because philosophies change the building must be adaptable.
3) Make it beautiful and comfortable.
4) Allow time for suggestions and reports to come from staff, students, the community resources that may use the building. Building a school is too important to leave to architects alone.
5) From the School Forum - do not delay adoption of the project until the last minute and then proceed to rush approval of plans, architects, engineers, contractors to meet a September deadline.

There are many things that can make a building functional or not functional. Many of these have to do with the philosophy behind what we are trying to do in the school. This takes us beyond the scope of our topic and more into design for the future so I will spend a few minutes on the more general aggravations as found in most current schools today. These are things that I believe must be looked into regardless of the type of school.

Cafeterias:

1) Most are pretty dull and not noted for comfort.
2) How many have washrooms attached? In most the student must wander over half the school to find a washroom.
3) Where can the students go when they are finished lunch? Usually the cafeteria has to be cleared for the next sitting.
4) What about cafeteria kitchen odours? Do they permeate the school?

I believe cafeterias should be separate or separable from the school.

Halls: are generally a great bone of contention - expensive lost space. What is forgotten is that a thousand or more people move on the average of every 40 minutes.

1) Are they narrow?
2) Do they have bottlenecks?
3) Are they acoustically designed to muffle noise rather than amplify it?
4) Lockers generally line the halls. This adds a great deal to the noise and confusion.

Inevitably poor hall arrangements lead to a profusion of traffic rules that are a source of dissatisfaction to staff and students alike.
I would like to see hall and locker areas separated from classroom areas.

If the school procedures change so that masses do not move at one time but smaller groups move at odd times the traffic problem may be solved but the noise and locker problems will become worse.

Gymnasia: The main problems are:

1) temperature and noise control.
2) maintaining fresh air.
3) are there doors directly to the outside?
4) large storage facilities are needed.
5) can it be separated from the rest of the building for student and other after school functions?
6) are team dressing rooms available?

Gymnatoriums are generally poor arrangements. The concept interferes with or limits gym design and seldom if ever makes a good auditorium.

Classrooms:

1) Noisy heating and ventilating units are a bugbear.
2) Are there drapes or good, odourless black out blinds?
3) Is there controlled lighting and ventilation?
4) Are there convenient electrical outlets?
5) In this day and age there should be a permanently installed screen and speaker for audio-visual equipment.
6) Are there bookshelves, racks, storage cupboards?
7) There should be sliding blackboard, bulletin board arrangement so the proportion of each can be varied.
8) The big question today is how adaptable is the classroom as we know it?

Library: Today an excellent library resource centre is a must. It should be located near the core of the school.

It should have reference areas, storage and book repair area, private study carrels, audio visual equipped, adjoining washrooms and a means of separating it from the rest of the school for evening use. It's appointments should help to create a feeling of calmness and desire to work.

Work Areas: Most of our schools don't have any.

1) For students - to work alone or in small groups. This is particularly important now with individual programs.
2) For staff - often teachers can't work in classrooms because it is in use even if the teacher is free. There should be a place to talk or work with a student privately.

In science, for example, there should be a prep room adjacent to a lab where experimental material can be prepared for the next class.

Finally, even in this part of the country, I make a plea for air conditioning. I have seen, regularly, temperatures in the classrooms vary from 60 to 90 degrees. These are conditions more inducive to shivering or sleep than study.

Some of the things I have brought up may seem trivial, but I do believe that if the aggravations can be removed, if the building facilitates grouping and movement, if it is cheerful and comfortable so that staff and students can work together rather than have to try and control one another, many of our problems can be solved. The human is an adaptable animal and as long as all of his energy does not have to be used adapting to a poor environment, he can be ingenious enough.

To close, I would like to quote from Dr. Murray Ross. "All of us at one time or another have been in school buildings that are downright ugly in themselves and rendered worse by their furnishing. If we ask students to spend daylight hours of young years mainly indoors it should not be in a barrack like building. I think people in such surroundings fail to respond to our adjurations to see esthetic beauty in literature, art, music. In such cases, the contrast between what society provides and what it praises is provocation to conflict.

USER'S REACTION TO CURRENT SCHOOL DESIGN
by K. MacKay

As a recent newcomer to the educational scene, I can in no way be considered an authority, qualified to comment on modern school design. However, by consulting with my associates and others with long experience in this field, I hope to put forth some valuable comments from the standpoint of the plant personnel.

We will necessarily offer more criticism than compliments, since it is only human nature, with the aid of hindsight, to criticize. Innovation has been much more rampant at the College and University level, and we might add, much more costly. But gradually, our public schools are shaking the stereotype design of the pre-war era, World War I and II that is, and taking on a more functional and realistic form.

First and foremost, our schools would be designed to the needs of the student, to promote his comfort and eagerness to learn. Far too often schools were designed to suit the architects' ideal of a school, the Department of Education's requirements, either aesthetic or economic and yes, even the Building Superintendent's concept of an ideal building from a cleaning and maintenance standpoint. However, seldom if ever, did anyone think to question the students on what they wished nor try to visualize their needs from their standpoint. Although we are trying to remedy this situation, even now I find myself thinking of school design from my own selfish viewpoint which is geared to plant maintenance and operation. Our designers are, of course, trying to accommodate us all in their school layout but still the student's requirements has to be the central theme of the design.

You are all familiar with the school design emphasizing acres of windows on all sides. We must admit to some necessity for this fifty years ago because of inadequate lighting. However, today's lighting standards eliminate all need for natural lighting and I am much in favour of reducing window areas to a bare minimum. Studies have shown that the student working in an area under normal lighting conditions with a very high window lighting effect on the sunny side of a school, undergoes considerable strain as his vision keeps adjusting back and forth to the two extremes of lighting values. From the plant engineering side, the reduction of window area has the following favourable results:

1. It reduces the risk of vandalism and window breakage.
2. It reduces heating costs.
3. It promotes better heating control between the warm and the cold side of the school.
4. It gives added blackboard and tackboard space in the classroom.
5. It improves the use of visual aids in the classroom.
6. And the previously mentioned studies show that there is little psychological effect on either students or teachers by the reduced window area. We, therefore, welcome the present trend to the elimination or at least reduction of window area in modern school design.

The foregoing lends itself to another trend just getting started and that is the electrically heated school. This form of heating was prohibitive due to high electrical rates and building design not properly oriented to this type of heating. However, changes in rate structure, more sophisticated control, and better insulating design have made this form of heating much more competitive. With electric heating, the architect is able to make better use of building area and to employ additional design freedom. There are other advantages but I'm sure they will be explored and developed in another panel group devoted to school heating systems.

A matter that we in the plant department take exception to are some of the latter day requirements emanating from the Fire Marshal's office with regard to modern school design. As an isolated example let me quote a recent letter to the Fire Marshal's Office sent out under the signautre of Mr. J. McMullen, one of my associates. I quote:

"I wish to draw your attention to the matter of regulations regarding the hardware requirements for fire exit doors on our schools and the lack of security in our school buildings as a result. This matter may have been drawn to your attention by representatives of other school boards and if it has this will serve to reinforce their representations. If not, in our opinion, it is a matter for immediate evaluation and attention.

Before the present regulations became effective, we used a deadlock, a push and a pull plate and a door closer on our exit doors. The custodian had to unlock the doors in the morning and they were then free opening throughout the day. At night when the doors were locked our buildings were reasonably secure. This type of hardware did not meet the regulations and has since been replaced by panic hardware. New schools have of course been so equipped from the outset. We have specified and continue to specify the best and most recently improved panic hardware the various manufacturer's offer but as yet have failed to find a type which cannot be opened from the outside by the children in the surrounding area. In fact this type of fastening seems to offer a challenge to these people. We have tried every means to combat the situation and have finally resorted to the use of a crossbar on the interior fastened to the door handles. We have then come, full circle, to the point where the custodian again must make

the rounds to unlock the doors in the morning, except that now we have ugly chains and crossbars which add nothing to the decor of the buildings.

I realize that our admission to the use of chains and crossbars is going to cause you some concern and no doubt will earn us some severe criticism and possibly the warning of reprisals. I would therefore suggest that investigation would probably disclose the same situation in every school district in the province. If this is so, and I have reason to think it is, it would seem to indicate the need for some research of the problem to find a more suitable answer.

It is our hope that the foregoing may lead to improvement in the regulations governing fire safety design in our schools.

Yours truly,"

This is only one example of regulations which we feel are not realistic and it may well be that we will learn the reasons for this in a presentation by Mr. Bateman from the Fire Marshal's office which was scheduled to precede this panel discussion.

As a plant maintenance man, I would like to see equipment specified that is easy to maintain. Our specification writers and consulting engineers should not let aesthetic appeal be the foremost criterion for hardware, plumbing fixtures etc. Surely we can allow some departure from the ultimate in artistic appeal in order to have equipment that our own maintenance people can repair and maintain, without resorting to the originalmanufacturer every time we have a malfunction or failure. We have well qualified tradesmen but there is a limit to their qualifications when it comes to maintaining sophisticated and innovative equipment. Our declining budgets do not allow for contract labour or expensive factory overhaul.

One of the more favourable new trends from our point of view, is block construction within the school, finished in ceramic or other artificial finishes which are easily cleaned and maintained, in appealing colours and which give many years of service. This wall construction has good acoustic value, is economical, clean and sanitary and has good resistance to wear and tear or vandalism. It also reduces frequent painting cycles formerly required in school rooms and halls and is much preferable to plaster or other wall construction forms.

Modern school design, and we refer particularly to the open concept, seems to demand floor carpeting or acoustical treatment for a proper teaching environment. We do not particularly share a great deal of enthusiasm for this trend since it undoubtedly costs more to install, is more difficult to maintain and clean and demands more expensive cleaning equipment to keep the carpet looking its best. There is also the theory in some quarters that a carpet is not as sanitary hygenically as terrazzo or vinyl tile. In any event, we would like to reserve judgement on this particular trend until we have operated a school completely floored with carpet. Such a school is presently being built in our region.

There are many things that come to mind to improve present school design. For instance, the local fire inspector abhors the present custom of displaying all the pupil's output in the halls of the school. In some schools, the hall has become just one continuous bulletin or tackboard, and even tables are now set up in hallways to display those productions not readily fastened to the wall. In this instance, I agree with the fire inspector that this condition creates a potential fire hazard. Could not depressed display areas be designed in the school hallways which would allow all the pupils' artistic accomplishments to be displayed without encroaching on the area needed for fire exits?

With the increasing use of schools by the community at large, should we not be giving more concern to designing out layout to allow use of school gymnasia, washrooms and specific areas to give easy access to the public and still preserve protection and privacy for the rest of the school? This type of floor plan would greatly assist the caretaker in controlling those using the school facilities and decrease potential damage or loss to the other areas. Summer recreational programs which use our school grounds and washrooms would also be encouraged by this type of school division.

And while on the subject of school layout, I would appeal to our architects to try to eliminate pocket areas around schools where transients or vandals can stay hidden from the police or public and are not exposed even by good floodlighting. It seems every one of our schools has one or two of these areas which seem to invite and encourage trespassers of the least desirable kind.

One of the most outstanding developments in school design has been the introduction of unit heaters in classrooms. This type of heater lends itself to good control, is easy to maintain, and is pleasing in appearance. The unit allows the introduction of fresh air to the classroom at any desired temperature and has added a new dimension to environmental comfort in the classroom. These units are effective whether heated by steam or electricity and promises to give many years of comfort conditions to the school classrooms.

These are some of my reflections and reactions to modern school design. As I said before, much of the information was gleaned from my associates and I would like to thank them for their assistance.